

MODEL AIRPLANE NEWS

SEPTEMBER 1945 • 20 CENTS

An AIR AGE Publication



GRUMMAN F7F TIGERCAT

TESTORS

DOPE



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135 MPH

WITH CHAMPION VEE GEE!

WHAT A SUMMER this has been for Vee Gee. The boys with Torpedoes have been turning 109 m.p.h. consistently. The top speed to date (Hornet power) has been 135 m.p.h., *then the lines broke.* With the new Tiger and well-built model and the proper prop, there is no reason why anybody should not get 110-112 m.p.h. with regularity, and with the bigger engines, Hornet or Atwood Champion, 135 m.p.h. isn't necessarily the top. *Nobody knows* what the top is for Vee Gee but everyone who owns one says it's the tops in model sport since the beginning of models.



De Luxe
Kit

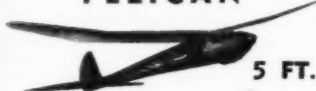
Complete kit
and plans

\$10⁰⁰

GET UP IN THE 100 MPH CLASS!

There's no use for you U-control fans to be content with less than 100 m.p.h. performance as a daily diet. Our advice is to sashay over to your model supplier's and walk home with a world's champion Vee Gee today. The kit is de luxe precision built throughout. All parts finished to sanding distance. Spar beveled to shape. Complete "exploded" diagram with full assembly instructions including how to make a take-off dolly. Vee Gee is a licensed tether model under Jim Walker's U-control patent No. 22924161.

PELICAN



5 FT.

TOWLINE BALSA GLIDER

She's big and she can take it. There's no 1/16" squares to give her floppy wings. Has Spar construction which means strength and a ballast compartment in the nose right where you can get at it. All balsa. One of the most successful gliders we have ever produced....

\$1⁰⁰

plus postage

As Bob Hope would say, "Ladies and Gentlemen, here's your friend, Modelcraft's sweetest heart, Miss Tiny." Here's the favorite of the strictly aviator-type jobs, a Class A champ with a record of first in every part of the country. And here's a suggestion: By reducing the wingspread 8", Tiny makes the sweetest U-control trainer you could get. Use a Bunch engine, Torpedo, or any power within the .29 to .45 cu. in. range. All-balsa standard kit.



MISS TINY

\$3²⁵



The KAYDET ALL-BALSA STICK MODEL

The kit that makes you a model expert in 30 minutes! That's the actual assembly time on this stick model, with all parts cut out, rubber, slotted cabane, and grooved top. Only 5 joints to glue, and a beautiful flyer.

25c

plus postage

X-CELL SPEED PROPS

in 8" to 11" Sizes

These are the props that were used on the record-making Vee Gee flights, and are still used by the Vee Gee designers. They formerly sold for \$2.00 apiece. We stepped up the production to give you championship prop performance for everyday flying. How many?

75c

plus postage



The GREMLIN GLIDER

Assemble in About 30 Minutes

Here's another job you can have in the air in 20-30 minutes. All balsa, die-cut parts finished down to easy sanding distance.

Full-size plans (for quickly reproducing any part you may bust.)

25c

plus postage

Best Synthetic RUBBER!

We have a sizable stock of best synthetic rubber thread. This is new rubber with plenty of life and stretch. (Immediate shipments to Jobbers and Dealers.

1½c ft.

POSTAGE: On orders up to \$1.00—15c. From \$1.00 to \$2.00—20c. Over \$2.00—25c.

Modelcraft

Largest Supply House in the West

11921 South Western Avenue, Los Angeles 44, Calif.

Serving Model Aviation 17 Years

MODEL AIRPLANE NEWS

SEPTEMBER, 1945

VOL. XXXIII, No. 3

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AN AIR AGE PUBLICATION

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OFF THE LINE

THIS month your Editor gives way to a piece written by Albert L. Lewis, former Director of the Academy of Model Aeronautics, who is overseas with the U. S. Army. His observations are so significant and timely that we know they will prove most interesting to all modelers.

OPEN LETTER FROM A G.I.

by ALBERT L. LEWIS

SUPPOSE you're one of those incurable model builders. Suppose you'd been cast up on a deserted South Sea island several years ago. And now, recently rescued, you're back home. Can you imagine how curious you'd be about aeromodeling activities?

If you can, then you realize how the overseas ex-modeling G.I. feels. What's the latest dope? Any sweeping design changes? Much contest flying? Is there any balsa or rubber? How about engines—and so on and on.

We've just had an opportunity to return in spirit to the contest lines and club meetings. A batch of model mags covering the past two years came our way and enabled us to make the mental trip home. You may be interested in our reaction; we're sure service modelers would like to have a quick view as seen through G.I. eyes plus a few personal observations.

It is surprising how many former enthusiasts managed to squeeze in a little model activity after donning a uniform. But those fortunate few were a wee minority once the boys began going overseas (pardon me, coming overseas). Take one character we know—he was in 13 different army camps in as many months, then port of embarkation, a troop ship and au revoir to all thoughts of modeling for a long, long time.

First of all, we were astonished at the tremendous amount of activity that has been logged. Clubs depleted by enlistments or draft boards have rebuilt anew with younger members or combined with other groups to carry on uninterrupted. Others have moved into YMCA's and set up classes. Hundreds have participated in community activities for the war efforts.

The manufacturers have evidently weathered quite a storm, what with personnel difficulties, materials shortages, and rising prices. Paper, plastic and cardboard have been used in kits—quite ingeniously.

One very good feature is the many new ideas and schemes incorporated into kit construction. Jigs and pre-formed keels are in wide use enabling the less experienced modeler to turn out a reasonably straight fuselage and creditable wing. These, combined with better plans featuring detailed instructions and step by step photos, should mean a lower mortality rate among would-be modelers.

Balsa seems to be returning slowly. A few engines were produced after the War Production Board allocated limited amounts of material to provide 25,000 motors for use in aviation education classes and projects. However, these were but a drop in the bucket labeled consumer demand. You still can't dash into your favorite hobby shop and take a choice of 10 or 12 engines as you could in the good old days.

Speaking of hobby shops, we'd like to put on record the splendid work many shop owners have done during the slim, dim days when materials were scarce and customers many. Much of the wartime activity and many of the contests were sponsored by these smaller stores.

For a long time we've listened to a few "purists" contend that a model club sponsored by a hobby store was a shoddy, com-

(Continued on page 62)

AN OPEN LETTER TO AMERICA'S MODEL DEALERS

Dear Dealers:

As you page through this new issue of MODEL AIRPLANE NEWS Magazine, seeking new merchandise for your store, you'll find many invitations to purchase. We naturally extend the same invitation. However, in doing so, we feel that we are in a position to offer you a number of "plus values" which deserve your thoughtful consideration.

First and most important is the fact that our present inventory is probably one of the world's largest in this field. From it, we are supplying thousands of satisfied dealers. We know they're satisfied through their letters and through their growing re-orders. We believe we can truthfully say that we can supply a higher percentage of the items you order than any other distributor in the model field.

Beyond this, we can assure you excellent service. All orders are cleared and shipped within 48 hours after being received. Our back order system is complete and back orders shipped promptly. In this way, all of our dealers receive their share of hard-to-get items such as motors, rubber, nylon and new material.

No other distributor in this field has done so much to divert retail purchases to its dealers. We do more than just give "lip service" to the idea that we don't want to compete with our own best customers. For months, all our consumer advertising has urged readers to buy their merchandise from Authorized Dealers of Paul Approved Models, featuring the Sign of the Friendly Gremlin. This symbol appears in all our advertising and is provided to our dealers for point of sale display. Whenever we do fill a direct consumer order or request for material, the customer gets a letter urging him to make his next purchase of Paul Approved Models from his local dealer.

In addition to this, our new system of daily, yes, I said daily, mailings makes the B. Paul Authorized Dealer the best informed dealer in model supplies anywhere. Every single business day our dealer customers get a list of the newest and "hottest" items available. The B. Paul Guaranteed Sales Plan, which has already made history in the industry, is likewise available to every B. Paul dealer.

Add to this our advertising mat service, monthly news bulletins, in addition to daily notices and a list of sales-proven exclusives, and you'll begin to see why more and more dealers are turning to America's fastest growing hobby supply house.

You can be sure we'll jump at the chance to show you why other dealers are able to tell us that through our help, their sales volume has increased from 20 to 30%, and their over-all profits as much as 50%.

Since we've done it for others, we can do it for you. There's no obligation; simply write in on your letterhead for further details, price list, catalogue and discount sheets.

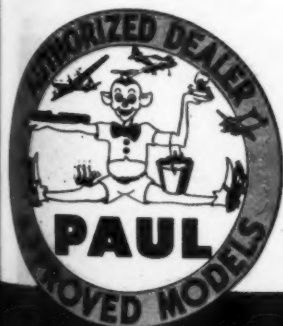
Sincerely yours,

Bernie Paul

B. PAUL MODEL DISTRIBUTORS, 6th & MARKET STREETS, PHILADELPHIA 6, PA.

A NOTE TO MODEL BUILDERS

Our apologies for not being able this month to feature and illustrate the newest in model supplies. If you'll read this Open Letter you'll see that, after all, it will be to your advantage to be able to purchase your model supplies right in your own community. It will save you time and money. Keep looking for and always buy at the Sign of the Friendly Gremlin.



Read the
**CAL-AERO
TECH ad**
carefully

**CLIP THE COUPON
MAIL IT TODAY**

Today—the makers of Super-Cyclone engines are heavily engaged in war production... (Aircraft and engine repairs, Airline reconversion, maintenance and overhaul)... requiring superior craftsmanship and precision. However, when the war is won, these same high quality and improved engines will again be available. We have no engines for sale now. Watch for future announcements in this advertisement.

**SUPER-
CYCLONE**

MANUFACTURED BY
GRAND CENTRAL AIRPORT CO.
SPECIAL DEVICES MFG. DIVISION
GRAND CENTRAL AIRPORT
GLENDALE 1, CALIF.



PLAN TRAIN IN SUNNY SOUTHERN CALIFORNIA PLAN



...NOW... for your AVIATION CAREER

INSURE YOUR OWN SUCCESS WITH A SOUND FOUNDATION OF TECHNICAL TRAINING

**AVIATION OFFERS YOU A GREAT FUTURE
BE PREPARED to take advantage of
great opportunities to come in this field.**

With wartime aviation to be put to peacetime use, countless opportunities await the technically trained man and his services will be valuable and in demand. Aircraft production will continue at a great rate in order to provide the thousands of private and commercial aircraft coming with the next few years. In addition to this, thousands of airports, airparks, flight strips and air harbors must be built. This means that thousands of hangars, machine shops, landing facilities and other needs must be provided to build up the utterly inadequate service and maintenance facilities for private and commercial planes. This also means the demand for thoroughly trained men will be great. Right now, instead of men with thorough technical training looking for positions, the positions are looking for them and aviation really needs these men who know their business. They need men more than

ever, with technical foundation and ability to operate and maintain service and maintenance facilities; without them the necessary expansion cannot take place.

Now is the time to lay your foundation for a future career, and remember—Aviation will always present opportunities to the man with a thorough technical foundation.

Cal-Aero Technical Institute gives you thorough technical training to enable you to prepare yourself for the exacting requirements of the Aviation industry. Since 1929 Cal-Aero Technical Institute has been offering the best specialized training to be had in **AERONAUTICAL ENGINEERING AND MASTER AVIATION MECHANICS**. It is basic, broad in scope and fits well into practical application and operation. With all non-essentials eliminated, these up-to-the-minute courses are completed in minimum time with a scientific quality about this training that has appealed to the executives of the Aircraft Industry.



CURTIS-WRIGHT & TECHNICAL INSTITUTE

THIS TOWER OVERLOOKS AVIATION'S MOST DISTINGUISHED SCHOOL OF AERONAUTICS

CAL-ACRO TECHNICAL INSTITUTE

FORMERLY CURTISS-WRIGHT TECHNICAL INSTITUTE

**GRAND CENTRAL AIR TERMINAL
1229 AIRWAY, GLENDALE 1, CALIFORNIA
(LOS ANGELES COUNTY)**

UNDER PERSONAL SUPERVISION OF MAJOR C. C. MOSELEY, PRESIDENT AND FOUNDER, SINCE 1929

ON OUR OWN AIRPORT - IN THE HEART OF THE AIRCRAFT INDUSTRY

"Cal-Aero" has an unsurpassed record of efficiency and experience with thousands of graduates in all phases of aviation plus the training of nearly 25,000 pilots and 7,500 mechanics for the Army Air Forces. It is recognized by the Aircraft Industry, California State Board of Education, on list of approved schools with U. S. Bureau of Immigration for non-quota foreign students, approved by Civil Air Board as Aircraft and Mechanics School, with C.A.A. approved courses—Member of National Council of Technical Schools—Member of National Aviation Trades Association—on list of approved schools on file with Veterans' Administration for Veterans Training under "G. I. Bill of Rights."

In addition, it is one of the oldest, largest and most substantial aeronautical schools in the nation and is located in the center of Southern California's giant aircraft industry, on its own huge airport.

Train at Cal-Aero in Sunny Southern California, where every training moment is spent learning something you will have to know, and subjects you study are the very thing you will have to do on the job. **WRITE OR MAIL COUPON TODAY FOR INFORMATION.**

VETERANS

Cal-Aero Technical Institute is on the list of approved schools on file with the Veterans' Administration, making discharged service men attending Cal-Aero eligible for the educational benefits as provided under the "G. I. Bill of Rights." Many ex-servicemen are now enrolling and taking advantage of these benefits here at "Cal-Aero" in SUNNY SOUTHERN CALIFORNIA.



BE WISE—PROTECT YOUR FUTURE

MAIL TODAY • DON'T DELAY

WITHOUT COST OR OBLIGATION SEND US FULL INFORMATION AND CATALOG ON THE COURSE CHECKED BELOW

- ☐ AERONAUTICAL ENGINEERING COURSE
- ☐ MASTER AVIATION MECHANIC COURSE
- ☐ SPECIALIZED ENGINE COURSE
- ☐ SPECIALIZED AIRPLANE COURSE
- ☐ POST GRADUATE AERONAUTICAL ENGINEERING COURSE
- ☐ SPECIALIZED AIRCRAFT SHEET METAL COURSE
- ☐ AERONAUTICAL DRAFTING COURSE, HOME STUDY
- ☐ AIRCRAFT BLUE PRINT READING COURSE, HOME STUDY

NAME _____

ADDRESS _____

CITY _____

STATE _____

DATE OF BIRTH _____

N 3

"Les" Myers says:-

**Hard to Get
Items are
Easy to
Find Here**

RELAX WITH A HOBBY



PLANES GAS MODELS

Coronet A-B.....	2.50
Buc. B. Spec.....	3.95
Baby V Shark.....	2.95
Dreamer.....	7.50
Baby Miss Behave.....	2.65
VeeGee.....	10.00
Interceptor.....	2.95

RUBBER MODELS SCIENTIFIC BALSA

Thunderbolt.....	1.00
Mustang.....	1.00
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Testor B 29.....	2.00
Consolidated Hellcat.....	1.25
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Black Widow.....	1.50
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Weasel.....	2.95
Leddy Amph. Jeep.....	2.50
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A A Gun.....	2.95
Half Track.....	1.50
Scout Car.....	1.50



SUPPLIES

X-acto Block Plane.....	1.00
X-acto Sander.....	.50
X-acto Metal Knife.....	1.00
Control Wire 100'.....	.75
Wet Cell Batteries.....	2.75
Hot Shot Coils.....	1.95
Battery Boxes.....	.40
10' Hi-Tension Wire.....	.50

add 10% postage each item.

Les Myers

MODEL HOBBIES

40 S. 16th St.

PHILADELPHIA 2 PA



CURTIS SEAHAWK scout plane is latest craft to join the U. S. Fleet. Single engine, single float design, it replaces the valiant Vought OS2U Kingfisher as standard catapult scout plane of the Navy. It is unique in being a single seater, first in the 30 year history of the type. Powered by a new Wright Cyclone nine cylinder engine, which is claimed to have the lowest power-weight ratio of any ever built, the Seahawk has folding wings and full span automatic slots. The single float, product of Edo, has a double bomb bay with retracting bomb racks.

NORTHROP AIRCRAFT INC. was awarded a \$25,000,000 additional contract for P-61 Black Widow night fighters, first such order to be released for publication under the new relaxed censorship rules. This order for additional planes will carry Northrop peak production on \$146,000,000 worth of the big pursuit planes through 1946. Two thousand additional workers are needed.

ANOTHER BIG ORDER goes to Fairchild Aircraft which doubles total contracts for the C-82 Packet cargo and troop transport. In addition to the parent company, North American Aviation's Dallas, Texas, plant is now completing the first of a large order for Packets.

THE LOCKHEED Constitution may now be revealed as a giant, double-decked four engine transport consider-

ably larger than the famed Constellation. The new monster will carry 128 passengers and a crew of 11 at 300 mph over a 2300 mile range. It has 9 staterooms, each with 2 berths, 12 additional berths, 89 reclining chairs, several rest rooms and a galley.

THE MONSTROUS Boeing XB-15 bomber Grandpappy, a forerunner of the modern super bombers, has flown his last mission and is headed for retirement after more than eight years of faithful service. The giant bomber, whose wingspan of 150 ft. is still 9 ft. greater than the B-29 Superfortress, still holds the weight lifting record of 31,205 lbs. payload set in 1939. Since its first test flight on April 17, 1937 the XB-15 has proved an experimental laboratory for "big" bombers, and for the last year and a half has served as cargo plane for Troop Carrier Command attached to the Sixth Air Force in Panama.

THE FIRST jet-assisted takeoff (jato) of the Army Air Forces was not a deadly warplane but a lowly Ercoupe personal airplane used for experimental purposes by the AAF. On August 6, 1941 an Ercoupe equipped with jato units took off from March Field, Riverside, Calif., marking the first such experiment in this country. The pilot was Captain (now Colonel) Homer A. Boushey, Jr., now

(Turn to page 10)



Newest Corsair joins fleet, the F4U-4. Changes include 4 bladed prop, bubble hatch, newer engine

Douglas XCG-17 revealed as a converted C-47 Skytrain with streamline caps over empty nacelles



The easiest 'READY-to-ASSEMBLE' Control-line ever perfected!

TARPON

with REDI-HOLLOWED, All Balsa 2 pc. Fuselage



SEE NEXT ISSUE FOR APPROVED PRICE

A 'bird's-eye' view of redi-hollowed fuselage showing the compact layout in streamlined TARPON

Licensed under
JIM WALKER
'U'-CONTROL U. S. Pat.
2,292,416

120 miles per hour

You may never get off the ground yourself—but you will NEVER forget your thrill of real flight with this sensational TARPON! Hundreds of spell-bound modellers have seen this model soar up to unofficial speed of 120 mph (powered with Super '60'). Here at Consolidated, as usual, we waited patiently for control-line perfection! Now it's yours! Construction-perfection, flight perfection, control-perfection! And we'll back this trio of claims on the broadest guarantee basis!

Completely finished 'REDI-HOLLOWED' 2 piece fuselage requires sanding only! 28 1/2" span wing fits snugly into fuselage calling giving flight characteristics—and strength!—never achieved before! 'REDI-HOLLOWED' fuselage provides a compact layout for motor (from small 'B' to largest 'C') battery, coil, condenser and control-line device! All units easy to get at, always!

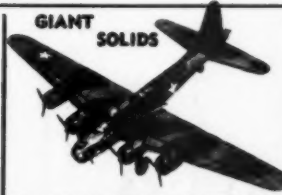
MONEY'S WORTH KIT! Your TARPON kit contains all materials needed! Printed balsa wing ribs, Cut-to-shape vertical fin, stabilizer and elevator. FLITEX for stab-hinges. Eyelets for entry of control-lines through fuselage and all items for control—set-up. Large sized, super-detailed, illustrated plans with much helpful building and flying material.

APPROVED PRICE IN NEXT ISSUE



JERSEY JAVELIN
ALL BALSA GAS FLYER

An easy-to-build, champion-performing model of famous 'Warrior' design for 'A' & 'B' Complete kit.



GIANT SOLIDS

The original solid-models with REDI-CARVED fuselage. 17 realistic designs from \$7.50 (28" span) to \$2.50. See previous issues for list of kits.



ROAMER

Mono-Strut Landing Gear, Double-Eligical Wing with Cantilever-Monoplane.

Stable, unfurling flyer for small 'A' or 'B'. All balsa in complete kit.



SUPER MINIATURES

Famous QUARTER INCHERS with redi-carved fuselage. Most models \$1.25, fully-filled kits.

Consolidated

MODEL ENGINEERING COMPANY (Dept. MA-9)
3087 Third Avenue
BRONX 56, N. Y.

An Air Force Captain Writes a Letter to CLEVELAND

For over quarter of a century, we of Cleveland have been devoting our energies to the designing of really fine models. Hundreds of letters from men in service are a living testimony of the price- less help these models have been to them in their share of the winning of the greatest of all wars.

Read What Capt. G.A.W.-G.A.7 Says:



THE CAPTAIN CERTAINLY EXPRESSES MY SENTIMENTS RIGHT DOWN TO THE LAST PERIOD.



THAT'S A REAL MOUTHFUL, CAPTAIN, BUT IT'S RIGHT ON THE BEAM.



YOU HIT THE NAIL RIGHT ON THE HEAD, CAPTAIN, THAT'S STRAIGHT STUFF.



I'LL TAG ALONG WITH THE CAPTAIN AND SECOND THE MOTION.

Please Note: This letter is not to be construed as an endorsement by the Army Air Forces

Officers Mail Section
A.A.B.
Cleveland Model and Supply Co.
4506530 Lorain Ave.
Cleveland 2, Ohio
April 25, 1945
Gentlemen,

I have been a navigator in the U. S. Air Force since 1940. I have flown in all types of B-17 aircraft as well as numerous other models. I can unqualifiedly say that nothing has helped me more in pursuing my duty than the construction of Cleveland Model airplanes.

I was stationed with the 19th Bombardment Group overseas and the knowledge that I gained from building Cleveland Models helped our squadron Japanese Zero fighter immensely in tying the listed until the sneak attack at Pearl Harbor.

In another instance I was able to identify an airplane which attacked us as an Me-109 when many officers in our group thought a new type fighter was being used by the Japanese. I can safely state without fear of contradiction that nothing is better suited for teaching recognition and flight fundamentals than constructing Cleveland designed model airplanes.

Sincerely yours,
G.A.W.
Capt. A.C.



Republic P-47 "THUNDERBOLT" \$4.00
30 1/2" - MFM Kit SF-51



Curtiss P-40 \$3.00
28 1/2" - MFM Kit SF-77



Grumman "HELLCAT" \$3.50
31 1/2" - MFM Kit SF-97



Japanese ZERO \$3.00
29 1/2" - MFM Kit SF-56



Messerschmitt ME-109 \$3.00
24 1/2" - MFM Kit SF-74

Here Are Cleveland Models of the Two Enemy Planes the Captain Speaks About

and Below, the Cleveland Model of the Bomber the Captain Navigated

MFM means Master Flying Model



Lockheed "LIGHTNING"
36" - AFM Kit \$4.00



North American "MUSTANG"
27-3/16" - AFM Kit \$3.00



Grumman TBF "AVENGER"
39" - AFM Kit \$4.00

BIG \$1.00 VALUES

IN GLIDER, TETHER, AND

GAS MODELS



GLIDER!
7 FT. SUPER-CONDOR SOARER
\$1.00
New design, C.D. semi-solid construction. Span 36" - AFM Kit



Boeing B-29 "SUPERFORTRESS"
New design, C.D. semi-solid construction. Span 36" - AFM Kit \$1.00



TETHER!
TETHER "SHARPIE"
High speeds, Clean A, B, C. Kit \$1.00 (without lines.)

Build These Big 3 Foot Models of Planes That Fought Over Europe!

Most Famous of All Planes BOEING B-17

The renowned "Flying Fortress," known as the most famous plane of World War II. The mightiest symbol of the might of America's air power. An absolute "must" among serious model builders, for it is a perfect representation of the AAF. 11 1/2". AFM Kit \$12.00

READ BEFORE ORDERING

BE SURE TO SEE YOUR DEALER FIRST! If he does not stock C-D or will not supply you, send check or m.o. Add 50c for packing-postage per kit. No C.O.D.'s. Postal restrictions now prohibit shipments outside U.S. except to Canada and Mexico (to which 10% must be added). For service men still stationed in U.S.: Restrictions prevent our shipping to A.P.O. or Fleet P.O. Box numbers—so, use a local nearby address only! Special Delivery 35c extra (U.S. only). Ohio residents only add 3% sales tax. All kit contents and prices subject to change or cancellation without notice. Minimum order \$1.00.



CATALOG
5¢
Free list at your dealers



38" Industrial Training Models for Learning Theory, Design, Construction, Flight

From top to bottom beginning at upper right: T35 Lockheed P-38 "Lightning", T76 Hawker "Hurricane", T79 Hawker "Typhoon", T74 Messerschmitt ME109, T77 Curtiss "Warhawk", T94 Piper "Cub", T76 British "Spitfire", T105 Westland "Whirlwind", T91 North American "Mustang", T158 Northrop P-41 "Black Widow", T76 Bell "Albacore". Each kit \$1.50

CLEVELAND MODEL & SUPPLY CO., 40500 LORAIN AVE., CLEVELAND 2, OHIO

"World's Largest Manufacturers of Quality Model Aircraft - Since 1910"

When You Build CLEVELAND MODELS You're Building the Models that Pilots, Bombardiers

Instructors, Cadets in Training, and Men in All Branches of War Service Build!

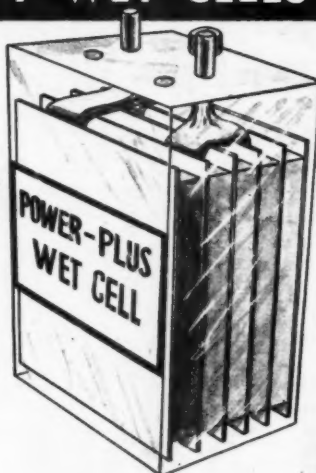
NEW! HEAVY DUTY WET CELLS

POWER—Plus

"Big 5"

**5 PLATES
LASTING
POWER**

Now, a mighty new source of lasting dependable power joins the famous POWER-PLUS family. Big 5's five big plates provide the sustained spark you want for heavy duty booster, model speedboat, race car, and stationary engine ignition. 2 volts. Rechargeable from auto battery. Supersealed.



**THE BIG FIVE
Wet Cell Battery**

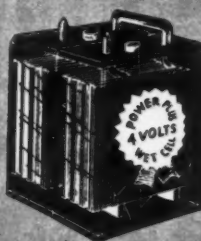
\$3.50



**FLIGHT
Battery**

2 Plates
Wet Weight, 2 oz.
Delivers 2 volts

\$2.75



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(Continued from page 6)
commanding officer of the 412th Fighter Group, Jet Training Unit, in California. The jet units were developed by the California Institute of Technology in Pasadena.

NEWS OF NEW British warplanes: the Vampire, a single seat jet propelled fighter developed by DeHavilland with a speed of more than 500 mph; Avro Lincoln, an improved Lancaster powered by four improved Merlin engines and featuring increased range and load carrying ability—it will be built in England, Canada and Australia; DeHavilland Hornet Gallant, an improved Mosquito bomber with a speed of about 470 mph; and the Vickers Spiteful, an improved Spitfire powered by a Griffon engine with a speed of about 460 mph.

NATIONAL AIR RACES will be resumed after the war if civic leaders in Cleveland, Ohio, bring present plans to fruition. A national aviation classic for nearly two decades, the races will be resumed immediately after V-J Day according to the group. Thompson Products, sponsor of the famed "Thompson Trophy" closed-course race for high horsepower class racers will resume their feature according to Raymond S. Livingstone, vice-president of the firm.

THE CONSOLIDATED Model 37, largest airplane ever built, may have helium in its tires according to company engineers. Total weight of the helium would be only 26 lbs. as compared to 180 lbs. of air required, a considerable saving. The monster carries 204 passengers and weighs 160 tons fully loaded (compared to 70 tons of the B-19, present size record-holder).

PRODUCTION CONTRACTS for the secret Hughes F-11 high speed photographic-reconnaissance plane have been cancelled, although the three experimental planes will be completed. Hughes has announced intention of being at the controls on the first takeoff of his huge flyingboat, now nearing completion. A million dollar insurance policy has been signed for the first flight. The giant will carry 750 soldiers and their equipment and has a span of 300 ft.

FIFTY NORTH AMERICAN P-51 Mustangs, first landbased fighters to raid Tokyo, have been delivered to Sweden through a sale arranged by the U. S. government. Sweden requested U. S. fighter planes and expressed a decided preference for the Mustang. The fast fighters were flown from a base in Britain to Bromma Aerodrome, near Stockholm. North American has assigned field service representatives to assist the Swedish Air Force in maintenance and operation of the planes.

LOCKHEED P-80 Shooting Star was first proposed in 1941, making the company the first American aircraft manufacturer to submit a "jaypee" design to the government, say company spokesmen. The idea was rejected in favor of increased production of P-38 Lightnings badly needed at the time. The Shooting Star engine has neither flame, glow nor smoke from its nozzle. Its rate-of-roll is claimed to be the highest of any plane in the sky!

A ROYAL AIR FORCE DeHavilland Mosquito recently flew from England to Karachi, India, a distance of 4700 miles, in 12 hours 25 minutes, an average speed of 378 mph.

THE FRENCH Government has completed nationalization of all air transport operations and has taken control of Air (Turn to page 12)

the Vagabond



the Dreamer



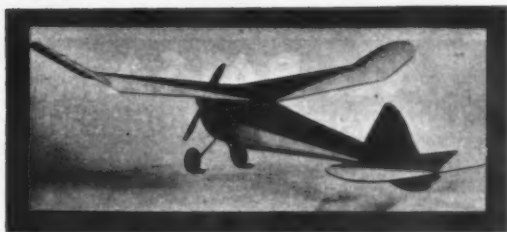
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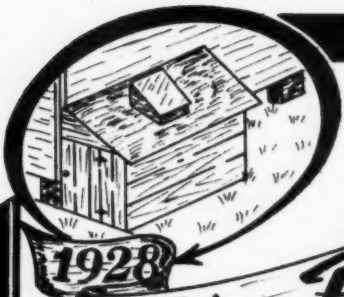
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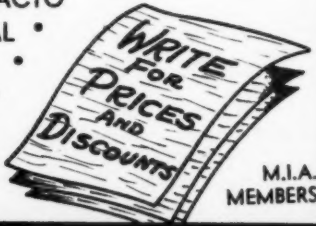
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(Continued from page 10)

France, Air Bleu and others. It will be recalled that the French aviation industry of 1939 was nationalized.

WILLOW RUN, largest industrial facility ever built, and subject of bitter controversy during its early days, has completed its last B-24 Liberator bomber and ceased to operate. The giant enterprise built 8,685 bombers and at its peak produced about 18 bombers a day. The plant was operated by Ford Motor Co. and no future plans have as yet been announced.

REPUBLIC P-47 Thunderbolt is the latest AAF fighter plane equipped with dive flaps, which are used to slow down speed during long dives to keep the plane out of the compressibility range. The Republic flaps are operated by Lear Rotary Actuators which are capable of instantaneously stopping when a predetermined setting is reached.

HEINRICH BERNHARD Oelrich, German inventor, designer and producer of German jet propelled fighters, has surrendered to U. S. 5th Inf. Div. troops. He has offered all his designs and patents on jet propulsion to the United States.

ACCORDING TO ex-Reichsmarshal Hermann Goering, the Germans were readying jet propelled bombers capable of flying to the United States, dropping their bombs and returning to Germany. The plane, known as the Messerschmitt Me 264, was a dual unit design and had passed experimental flight tests. Goering, in an interview with Maj. Alexander P. deSeversky, stated the prototype of the bomber used too much fuel but that this problem was rapidly being solved. He is quoted as saying: "The planes would have been ready for operation within

(Turn to page 52)

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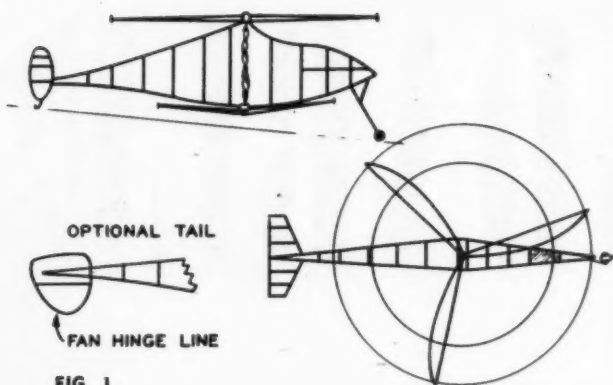


FIG. 1

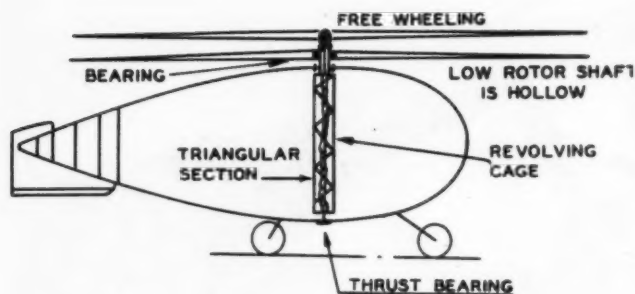


FIG. 2

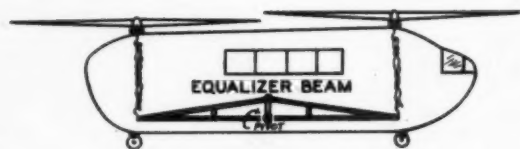


FIG. 3

FIG. 3

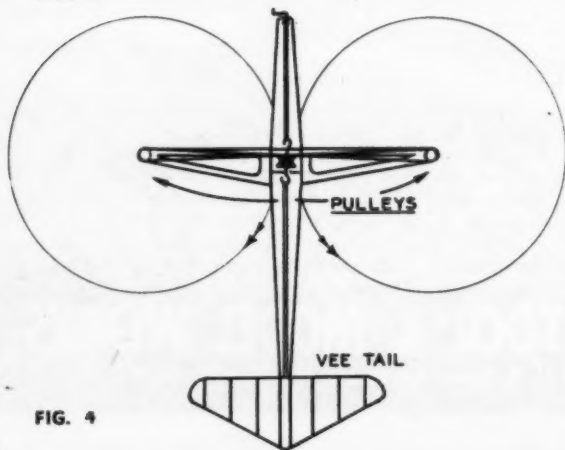


FIG. 4

by R. L. CLOUGH JR.

A timely, interesting Article
on a subject that has been
stumping the experts for years

EXPERIMENTERS in the model helicopter field soon discover they are working with a tricky breed in which instability is inherent and where such terms as "balance," "keel surface" and "power transmission" take on a deeper and at times maddening significance.

If one approaches the holy trio—dihedral, downthrust and balance—with the proper degree of reverence in designing a fixed-wing model, it is a fairly simple task to plan a ship that will fly and fly well. However, this is not so with helicopters. In the model helicopter, and we are speaking of those intended to represent the real thing and not the familiar whirligig of the "freak" contest, one soon discovers dihedral, or coning angle of the blades, does not assure stability; that balance may be a variable due to gyroscopic action when "stiff" rotor blades are used; and that "downthrust" has no true counterpart.

Unlike most scale models, the fact that a full size machine has flown does not necessarily mean a model helicopter built to the same pattern will be successful. This discrepancy is due in part to what is commonly called "scale effect," and

BASIC DESIGN

because in a larger machine there is a pilot along to constantly correct flight aberrations as they appear. In power transmission, friction losses in a model run far higher in direct proportion than in full scale machines. Torque effect is also more pronounced because more power is needed proportionately to fly a model.

Therefore, in order to secure successful flights, the modeler must design his little ship in such a manner as to insure inherent stability—something which makers of full scale machines have not been too successful in to date.

The greatest single problem in helicopter design is: What to do with torque? Shall we concentrate on using it, nullifying it, or plot such a design wherein it may be successfully ignored?

Since this article is dealing primarily with rubber powered helicopter models we shall concentrate on the first two; either to nullify torque or use it. The latter method of plotting a design wherein torque may be ignored involves self-motivated rotors, propelled by jets at their tips, and confronts the modeller with many mechanical difficulties.

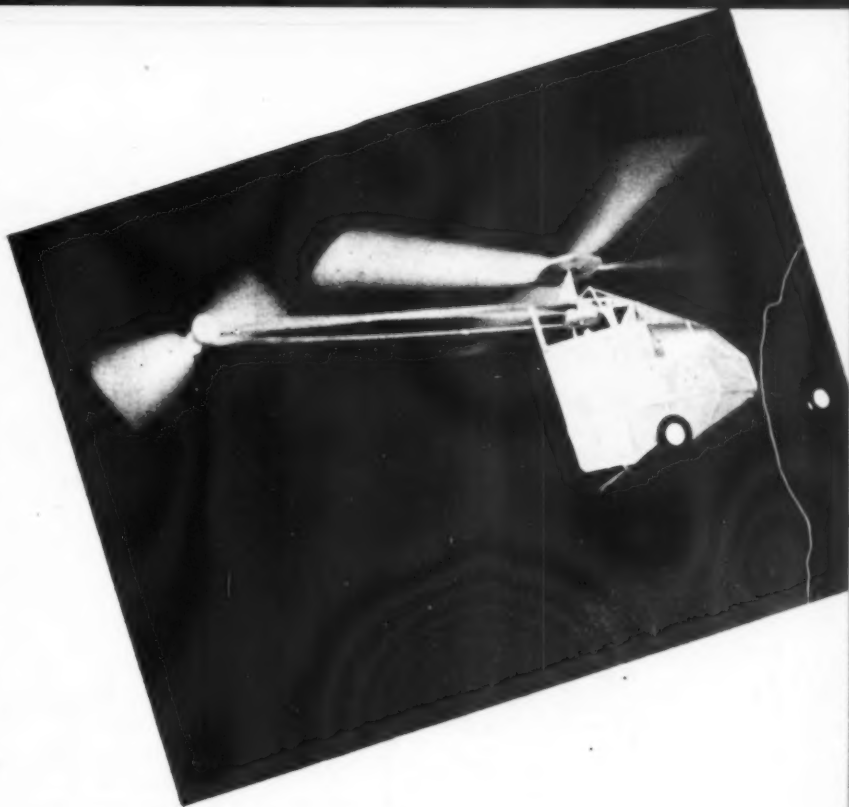
Perhaps we speak rather loosely of "using torque." What is meant is that torque is being "used" in a model when the method of eliminating it contributes to the overall lift. When this equalization does not contribute to the lift it is considered nullification.

Gyroscopic action is another bugbear. It will always be present to a certain extent, but evidence at hand indicates it is not an insurmountable problem. Flexible blades and articulated rotor hubs do much to alleviate this effect. Proof of the power of this effect was made quite apparent to the writer in an early model design. This model was of the single-rotor and torque prop design and featured a heavy, non-flexible main rotor. It was discovered that when the model was hand launched it would maintain the position in which it took the air until the motor had wound down enough to permit the weight of the machine to overcome the gyro action and return to an even keel. This effect was so pronounced that the model would fly on edge for several seconds before leveling off when launched in that position. Subsequent experiments with a flexible main rotor definitely laid the blame for this condition at demon gyro's door.

When choosing the type of design to work with, the experimenter should make up his mind to stick to that type until he is thoroughly familiar with its intricacies.

There are five basic types of helicopters and many modifications of each. There are certain disadvantages to each type and all lack the simplicity of rigid wing aircraft.

Probably the most familiar is the Sikorsky type which corrects for torque by means of a smaller rotor at right angles to the larger in such ratio as to amply compensate for torque at all speeds.



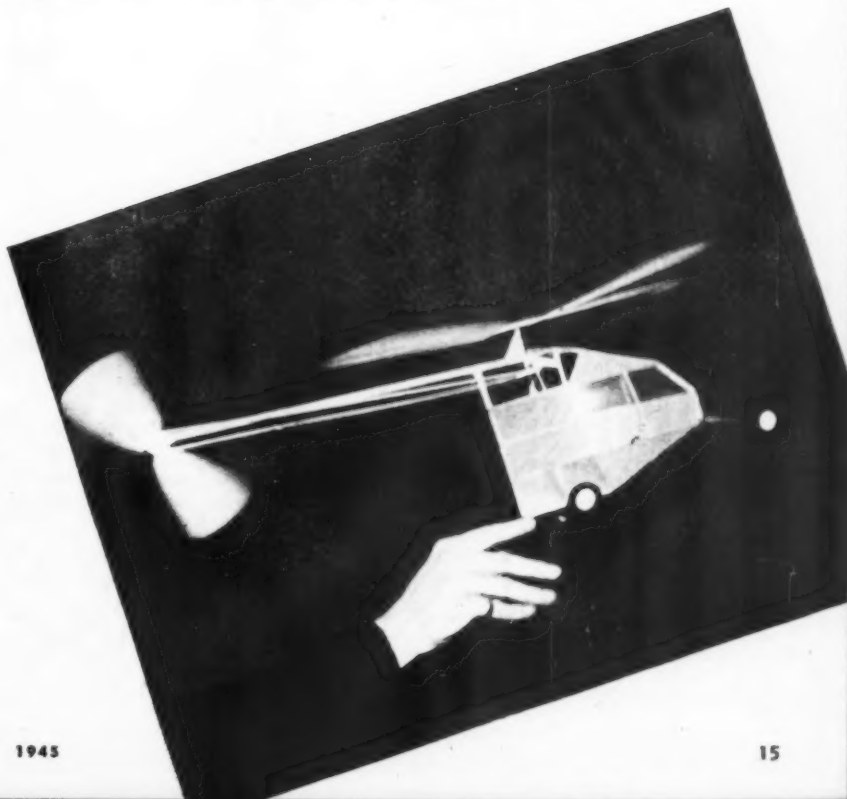
PROBLEMS OF MODEL HELICOPTERS

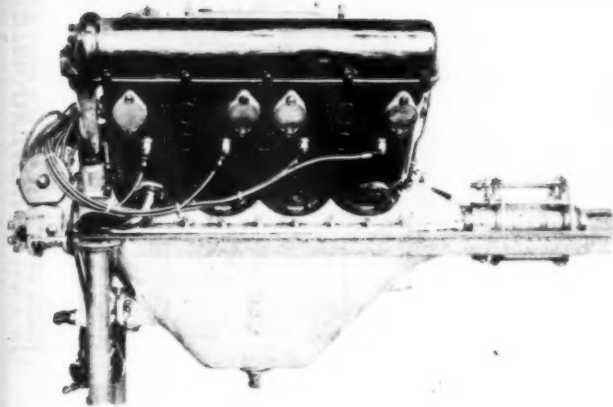
Second is the contrarotating, in which two main rotors revolve in opposite directions around a common center. The De Bothezat, Hiller-copter and Bleriot machines are good representative types.

Third is the twin-rotored helicopter utilizing two main rotors of opposite rotation extended on booms from the side of the aircraft. A variation of this principle is to put the rotors at opposite ends of the fuselage, thus doing away with the booms. The Landgraf, Platt-LePage and German Focke-Achgelis are examples of this trend of thought. This type is probably the oldest.

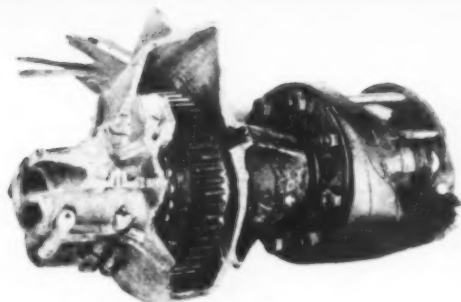
Fourth is a fairly recent innovation and the writer has been unable to secure information as to whether the machine has actually been built or was merely proposed. Three rotors are employed, a large main rotor in the middle and two smaller ones on booms, rotating in opposition from the main rotor to counterbalance its torque. From casual inspection it would seem the gearing necessary to accomplish this would result in something of a plumber's nightmare, with more power being absorbed by gear boxes than by the rotors. Control, too, would offer quite a problem. Either all three rotors must be controllable entailing a great deal of weight and machinery, or possibly control could be effected through the large single rotor which would undoubtedly throw dangerous

(Turn to page 57)

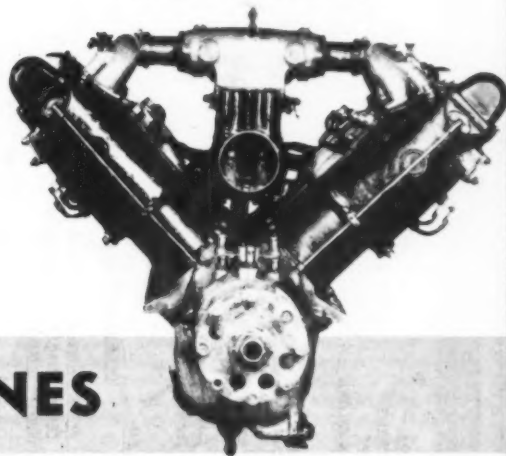




Side profile view of Hispano-Suiza engine



Cutaway view of reduction gear



Front view of Hispano-Suiza engine

Wylam offers something different and exciting for modelers to build.

by WILLIAM A. WYLAM

HISPANO-SUIZA ENGINES

IN THE spring of 1915 the French combat fliers were tired of the many disadvantages of rotary engines which were almost standard equipment of the French Air Arm. They complained bitterly to the French Air Ministry that their aerial defeats could be reduced by abandoning the use of these engines.

At that time the Germans were undisputed masters of the air over the entire battle area because their planes were equipped with Mercedes and Benz stationary engines whose performance was vastly superior to any other aircraft engines in the world. They had ingeniously developed their stationary engines to a high degree of reliability. They standardized the bulk of their engine production on the stationary types and made rotary engines only for experimental purposes. With this intelligent handling of their stationary engine development, German airplane performance was very effective in aerial war.

French pilots claimed that rotary engines sometimes made airplanes unmanageable, especially during tight maneuvers. They also claimed there was constant anxiety when they took off; due to the tremendous torque set up by a rotary engine the airplane had a tendency to veer in the direction of rotation of the engine. This excessive torque had to be overcome by exerting pressure on the ailerons and required the full attention of the pilot to maintain the airplane in stable flight. Thus when French pilots engaged in combat they were physically and mentally tired.

The Germans were well aware of the flight characteristics of planes powered by rotary engines, and their favorite

trick was to hit the airplane on the side opposite the direction of rotation. In other words, if the rotation was clockwise the Germans attacked the starboard side. This tactic proved fatal to large numbers of French and British fliers because they were unable to control their ships during tight evasive maneuvers.

The French Air Ministry, aware of the sad plight of their air arm, called all engine manufacturers to a hurried conference where they were requested to submit designs of a stationary engine that would surpass that of the Germans. Numerous engines were designed and built in record time. All were submitted for trials, and the winner selected was the Model A, Hispano-Suiza engine which was adopted and standardized by the French in the spring of 1916.

In August 1916 it was first installed in a new airplane, later called the *Spad*. And when these new planes were sent to the front the tide of the air war was turned. Here in the thick of combat the new engine convinced the French Air Ministry of its value as a fighting machine.

The early successes of the Hispano-Suiza engines resulted in large orders being placed by the French, English and Italian governments and led to the development of other types. The need for a non-rotating engine was met in this new design of the Hispano-Suiza stationary engine which was so satisfactory and so superior to other non-rotating engines that manufacturing facilities were greatly expanded. In order to produce the large number required, factories were built in England and America, and at the termination of World War I over

50,000 engines had been produced.

In England the engines were manufactured by Wolseley Motors, Ltd., who called their various models by such names as *Python* for Model A, *Viper* for Model C, and *Adder* for Model D.

In America the Hispano-Suiza engines were produced in large quantities by Simplex Automobile Co. and Wright-Martin Aircraft Co. Almost all these were of the 300 hp models. After the Armistice, Wright-Martin Aircraft Co. was renamed Wright Aeronautical Co. and the engine produced was called the *Wright-Hispano*; later they were designated *Wright* engines. The Wright Aeronautical Co. claimed they had made so many improvements and changes of the original design that the engine produced by them was truly an American engine.

The Hispano-Suiza engine was really the brainchild of a Swiss civil engineer named Marc Birkigt who commenced his excellent design work in a motor shop at Barcelona, Spain in 1906. Due to the poor labor markets there his firm moved to Paris before the outbreak of war. However, while in Spain he designed many famous Hispano-Suiza racing cars. Since the original factory was located in Spain and the Chief Designer was a Swiss, the name Hispano-Suiza was chosen for the firm—the English translation is Spanish-Swiss.

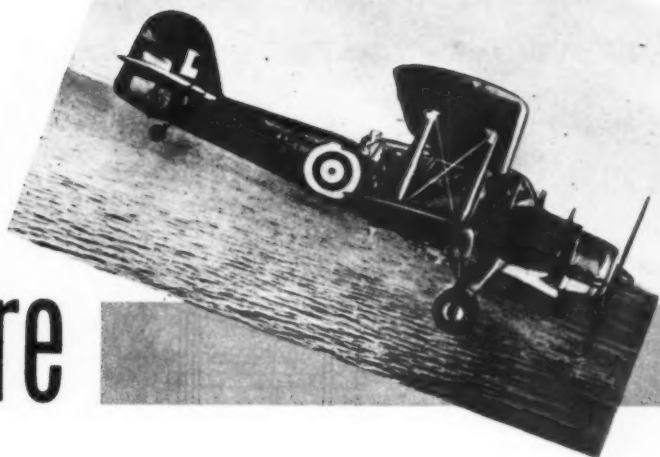
Although these engines were developed in a great number of sizes and types, all models were identical in exterior appearance; all had the same design and construction features of the original model. Of course numerous mechanical changes

(Turn to page 56)

by BRUCE K. WENNERSTROM



the albacore



THE Fairey Albacore will rank high in any list of famous planes of World War II. Although classified obsolete by many military authorities at the outbreak of war, the British employed this machine in strikes at Italian shipping in the Mediterranean. Its most notable successes were achieved off the coast of Sardinia where on Nov. 27, 1940, hits were scored on the battleship *Vittorio Veneto* and a cruiser.

It was this plane that was sent against the *Bismark* as that German raider was making good her escape after sinking the *Hood*. The Albacores stopped her. Their torpedos couldn't penetrate the *Bismark's* heavy armor but they knocked out her steering gear and left her to circle aimlessly until surface units of the Royal Navy arrived to finish her off.

Until last year, when *Barracudas* began to replace them, the Albacores were the standard torpedo bomber of the British Navy. The Albacore is powered by a 1060 hp Bristol *Taurus II* radial engine, has a

top speed of 190 mph, cruising speed of 150 mph, range of 700 miles and a ceiling of 20,000 ft. Span is 50 ft., length 39 ft. 10 in., and height 14 ft. 2 in.

The Albacore makes an ideal control line model. The long tail moment arm coupled with a large stabilizer and rudder make it unnecessary to change any dimensions when scaling the ship down for control line flying. The landing gear is beautifully faired. Plastic canopy eliminates the high-drag cabane structure and open cockpits. The torpedo contains the two pen cells which make it convenient to change batteries and at the same time lowers the c.g. A radial engine makes it possible to completely cowl even large C engines except for the upper part of the cylinder. Even the construction of the real ship lends itself perfectly to modeling; wings and tail surfaces are fabric covered, fuselage metal covered. The model's wing and tail surfaces are tissue covered, the fuselage planked. The multi-

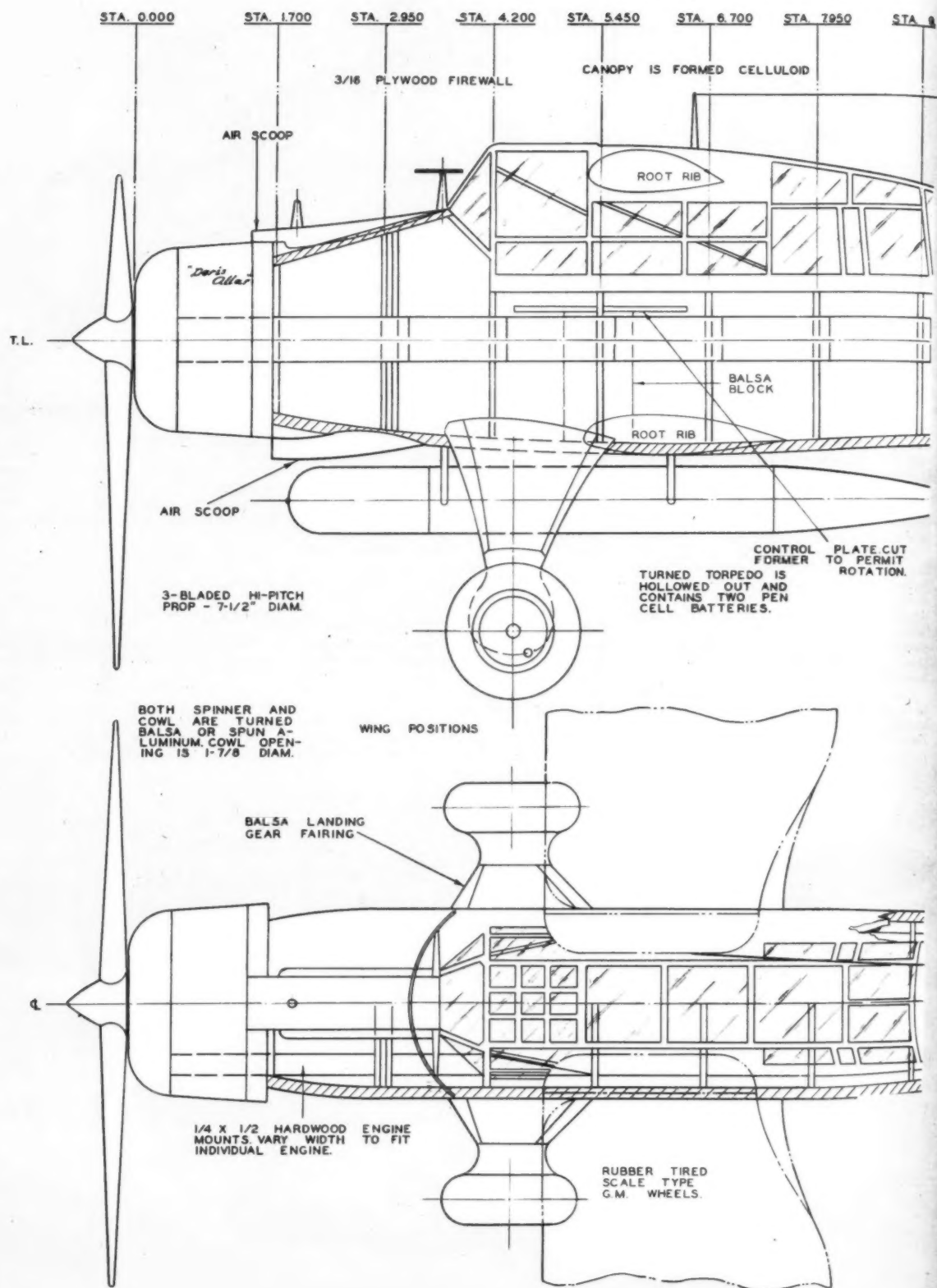
rib construction of the flying surfaces adds greatly to the realistic appearance of the model.

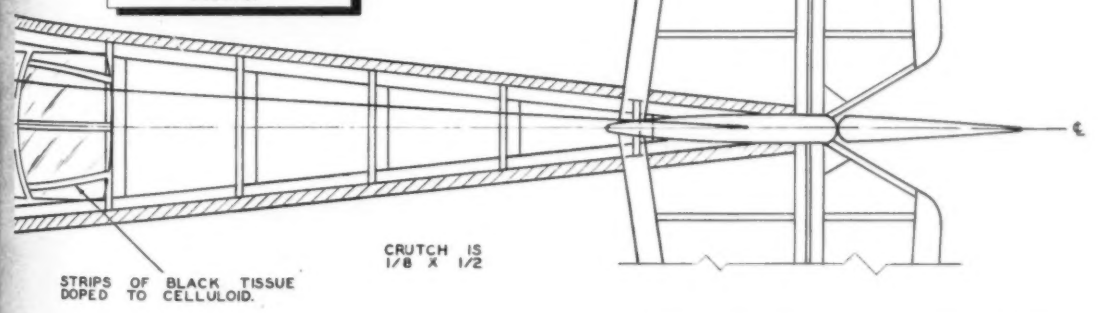
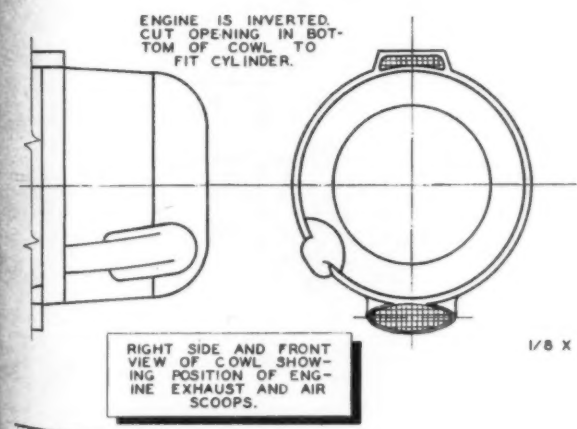
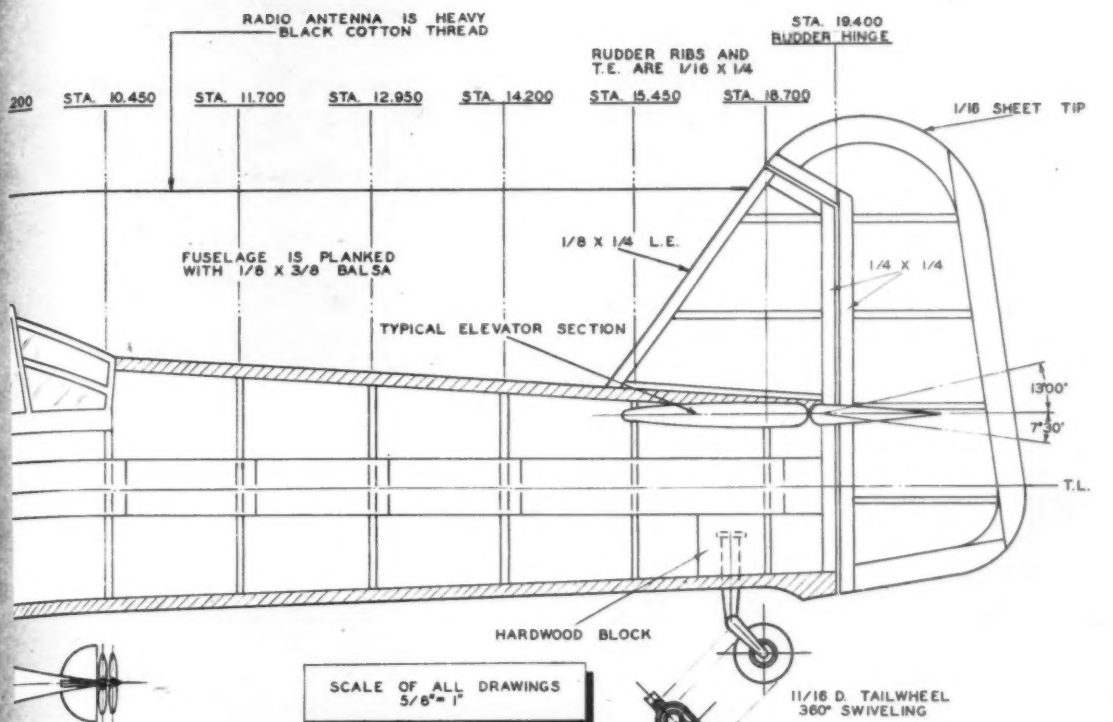
Myriad control line models have appeared in model magazines of late. More often than not the story runs something like this: "This model was not designed for speed or aerobatics but is a trainer which will take the hard knocks that the novice will give it while learning." However, the designation "training plane" is often an excuse for poor performance and design. The quantity of "training planes" seems to us to be sufficient to equip each prospective control line fan with a different design.

The Albacore is a contest model. It represents just about the ultimate in scale biplane design. It has the wing area necessary to meet A.M.A. rules, something which most popular U-Control biplanes lack. It excels in aerobatics, and with a "souped-up" engine in front will

(Turn to page 44)







SEE TEXT FOR FUSELAGE COLOR SCHEME

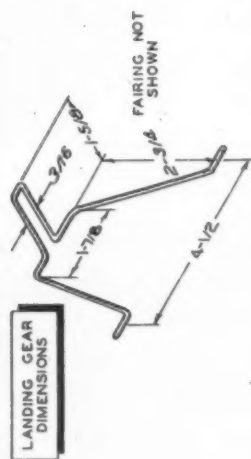
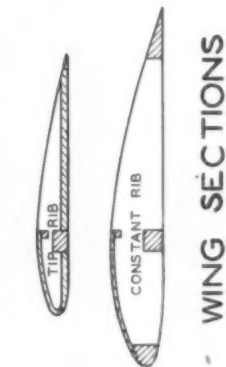
FAIREY

ALBACORE

DESIGNED & DRAWN BY~

BRUCE KENT WENNERSTROM





BRUCE WENNERSTROM

FURTHER DETAILS
RESTRICTED

GRUMMAN F7F TIGERCAT



A



B



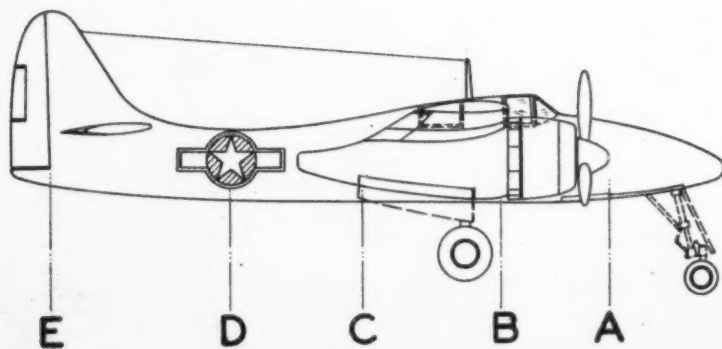
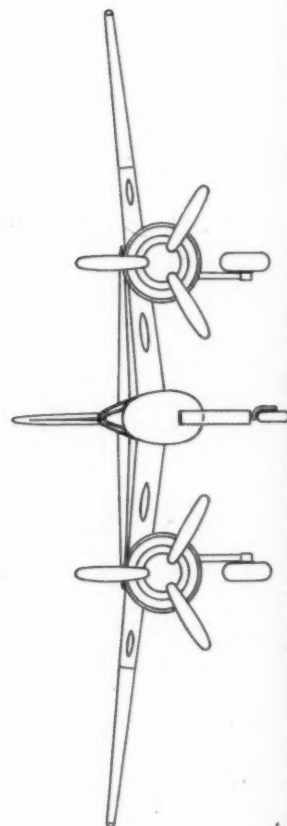
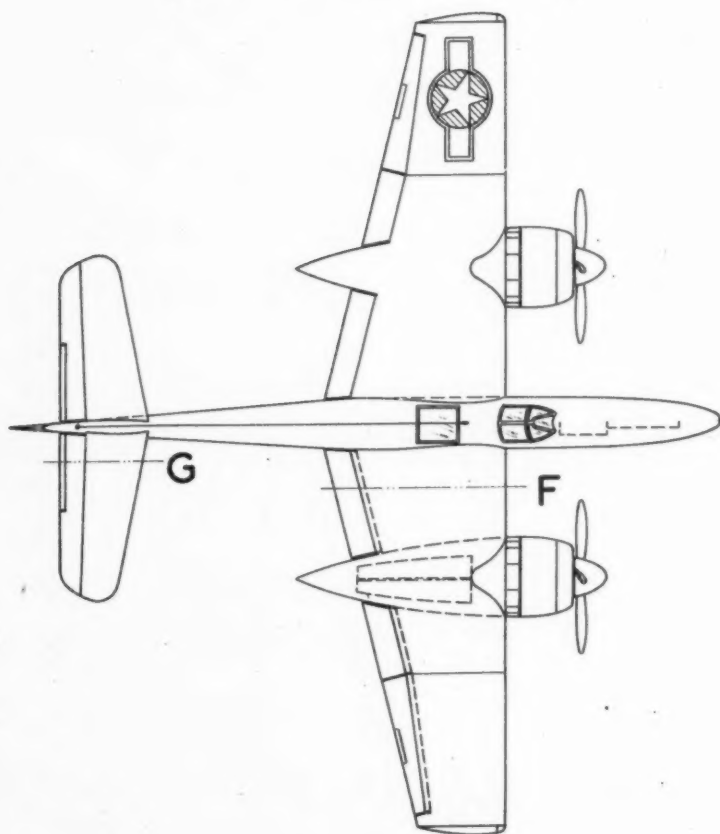
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MOD

THE Grumman F7F Tigercat—newest and deadliest Navy fighter plane now serving in the Pacific—is the biggest, heaviest and most powerful of its type ever to bounce its wheels on a flat top. Twin engined and sleek, it is the answer to a fighter pilot's prayer. Fast, quick and rugged, it's Uncle Sam's challenge to the newly announced Jap fighter planes. It's the champ in the ring for the last round!

Conceived at a time when the world was astounded by Doolittle's historic raid on Tokyo, and when Jap carrier fighters roamed the wide expanse of the Pacific at will, the Tigercat incorporates four years of lessons learned the hard way slugging it out against the Japs.

While production lines hummed to the gnarl of the F6F Hellcat, Grumman engineers laid down the design of the first twin engine Navy fighter plane in mass production in history. While our task forces plunged westward towards Tokyo, Grumman technicians installed the Navy's first production tricycle landing gear on this new fighter plane.

This amazingly deadly air-war weapon was made possible by one of the most remarkable partnerships in aviation. Leroy R. Grumman, President, is the brains and Leon A. "Jake" Swirbul, vice-president, the voice and sinew of the team. Together they comprise a unique unit that has designed and produced more airplanes since Pearl Harbor than any other aircraft factory in the entire world!

Plane on the Cover



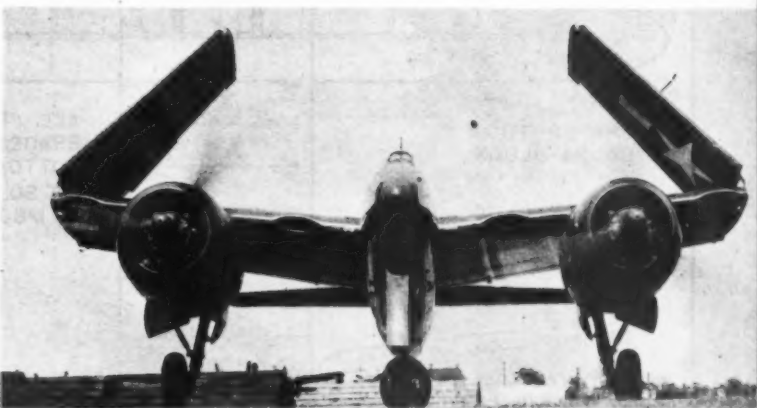
by **ROBERT McLARREN**

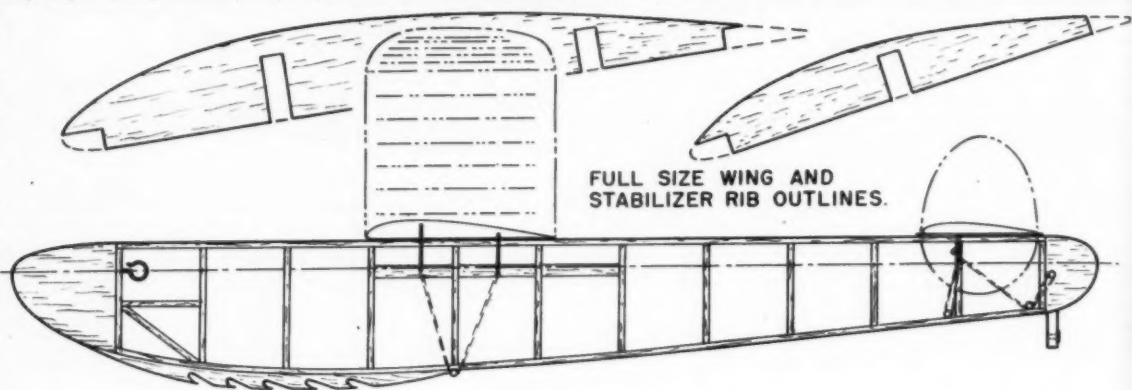
Grumman, a naval aviator during World War I, is Chief Design Engineer of the firm and he turns out all the preliminary ideas and basic layouts of new Navy planes with the aid of W. T. Schwindler, Chief Engineer. Together with the engineering staff, Grumman is the scientific brains of the firm whose job it is to work in terms of "tomorrow." (How well he performs that difficult role is apparent from the fact that as news of the Tigercat goes to press, another more advanced design is now undergoing Navy tests: the F8F Bearcat!)

One edge the Jap designers have managed to keep over the Americans is a high rate-of-climb. They have done this by extremely low weight airplanes. We dare not fight a design battle with them on their own terms for low weight means elimination of the very items mandatory on American fighter planes: plenty of armor, self-sealing fuel tanks and emergency equipment. Our only weapon is horsepower, and Grumman saw that even the most powerful radial aircooled engine (Navy requirement since 1928) available could not provide the power to carry the weight of this equipment at the climb he desired. The answer was simple: use two of them!

The Pratt & Whitney Double Wasp R-2800-C was selected and this provided a standard power of 4200 hp for a start!

(Turn to page 48)

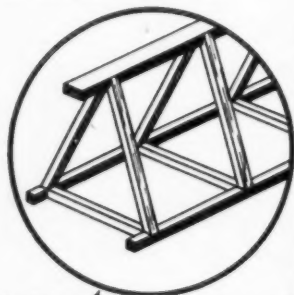




FULL SIZE WING AND STABILIZER RIB OUTLINES.

TOP LONGERON OF FUSELAGE IS STRAIGHT - CROSS BRACE SPACING IS 2" THROUGHOUT.

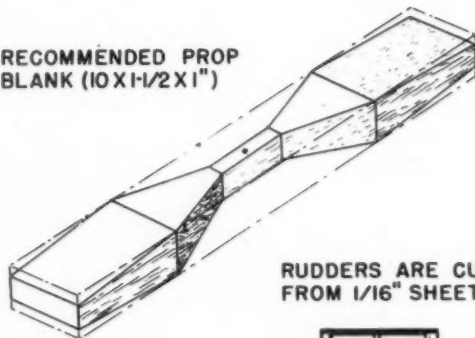
ALL WING AND STABILIZER RIBS SPACED 1" APART.



DETAIL OF FUSELAGE CONSTRUCTION

1/8 X 1/4"

RECOMMENDED PROP BLANK (10 X 1-1/2 X 1")



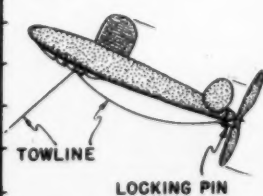
RUDDERS ARE CUT FROM 1/16" SHEET



SHAPED FROM Balsa Block

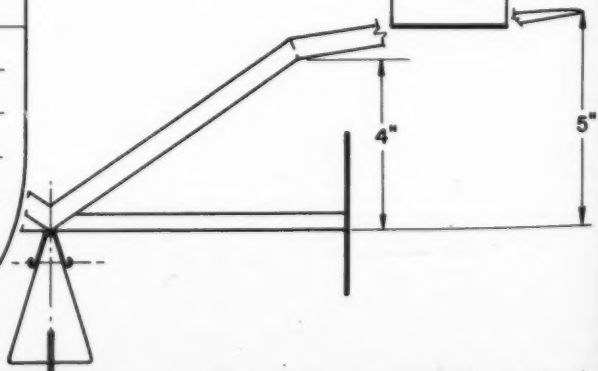
ALL FUSELAGE CROSS BRACES ARE 1/8" SQ. BOTTOM LONGERONS ARE 1/8" SQ. - TOP LONGERON IS 1/8 X 1/4".

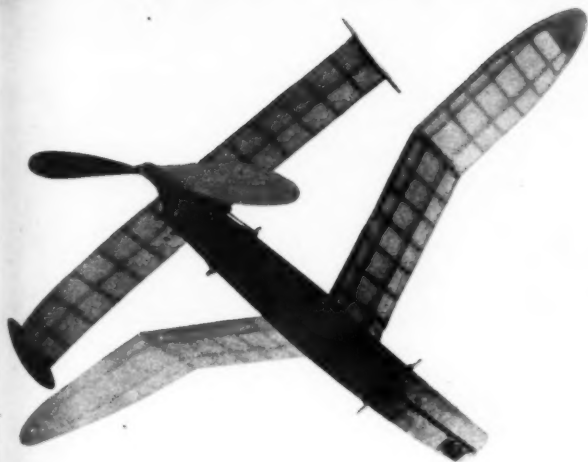
SKETCH BELOW SHOWS MODEL IN TOWING POSITION, WITH PROP LOCKING PIN IN PLACE.



TOWLINE

LOCKING PIN





SKYCHASER

Will you be able to resist building this model? We don't think you will

DUE to the rubber shortage many methods have been devised for preserving what rubber is available. This model is the result of such conservation. Towed aloft as a glider the model can start powered flight from an advantageous altitude by a mere second tug on the towline. (See small sketch at lower left hand corner of plans.) This enables the model to maintain altitude for thermal sniffing and allows sustained power flight with a minimum amount of rubber.

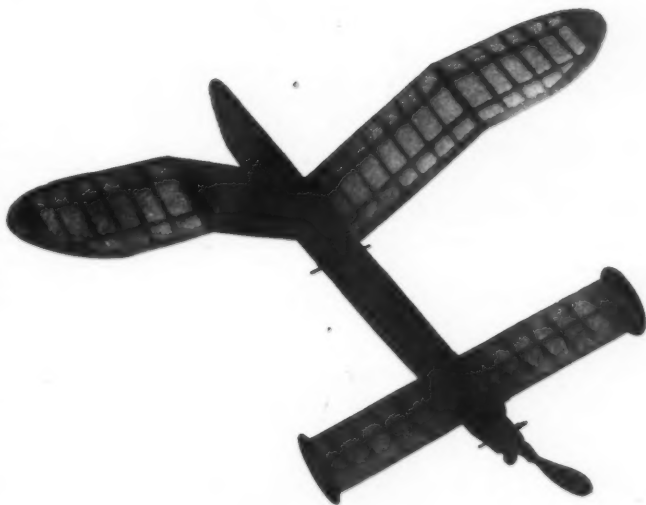
Construction is ordinary, balsa or hardwood being employed throughout with equal results. Make the bottom or "crutch" section of the fuselage first. With the exception of the $1/8 \times 1/4$ top longeron, $1/8$ square balsa is used throughout. Carve a nose piece of medium balsa to shape and cement in place. A hook bent from music wire is cemented securely to the nose block. Shape a strip of $3/32$ or $1/8$ balsa sheet to conform with the curve at bottom of fuselage, and carve a series of grooves into it before it is cemented in place. These hooks provide variation in placement of the towline on calm days when a rearward positioning of the towhook aids in getting the model up properly. Conversely, on windy days, a forward positioning of the towhook may be effected for optimum results.

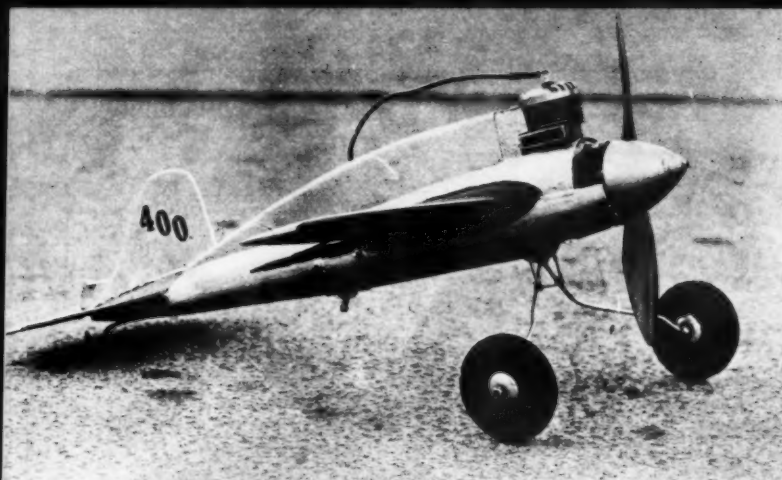
The wing is made in the usual manner. Leading edge, trailing edge and spar sizes are given on the plans. If desired, capstrips may be used in both wing and stabilizer to obtain a smoother covering job. Stabilizer construction is similar to the wing. The rudders are the acme of simplicity being cut from medium $1/16$ sheet.

The prop blank size is given on the plans. Remember while carving that it is a *pusher* not a *tractor* prop. A ready-carved propeller of the wide bladed type is used. The usual run of narrow blade props will prove unsatisfactory as there is very little waste power available in this design.

In towing aloft for a flight, a ribbon or small piece of lightweight tissue is fastened near the towhook so that slackening the towline will pull the hook off. Now a tug on the towline pulls out the prop retaining pin allowing the prop to revolve for powered flight.

The purpose of this model is to accomplish the most with what is available so don't look for spectacular performance. Properly adjusted, the model will start "perking" on all fours at altitudes varying from 50 to 100 ft. depending on how smoothly the model recovers from the tow.





No. 2—H. Faulkner's World Speed Champ 400 is an original design



No. 1—Sgt. L. B. Porter's Ohlsson powered Dreamer

AIR WAYS

PICTURE No. 1 was submitted by Sgt. L. B. Porter, Jr., of 3025 James Ave., Ft. Worth 4, Tex., and he is justifiably proud of his *Dreamer*. The ship is powered by an Ohlsson 60, and a 50' guide line was used for the elevator control. The sergeant says everyone who has seen the model perform is amazed at its speed and beauty. We think L. B. has had a "dream" come true because, to quote his own words, "of all the models I've built this excels them all."

Mr. H. Faulkner, 2626 West 36th Vancouver, Canada, sent in No. 2 showing his record breaking model, the 400. Further details will be found in the "Club News" section.

The Hawker Typhoon control line job illustrated in No. 3 is the work of Russell Webber, 5729 Lake St., Chicago, Ill. The model is built to a 1" scale and Russ does not remain alone in thinking this is one of the finest he has ever built. Considering that he has been building models for many years, the conclusion carries more weight than the ship. Incidentally, Russ is Contest Director of the Control Line Association of America.

No. 4 was sent in by Max Schulze of 4803 N. E. 32 Ave., Portland, Ore. Max says his Nieuport 17C-1 was recently completed and the photo taken in the Photo Lab of the Oregon State College with the expert advice and assistance of J. C. Garman. The model is 1/4" scale as are all the ships he has built during the past few years; they range in vintage from 1915 to 1945 and Max claims he is still "going strong"—in fact his recent models prove it!

R. W. Prouty, 322 Shirley St., Pullman, Wash., submitted No. 5, displaying his Curtiss XP-55. He writes: "The plans were drawn up from four photographs, none of which gave a good view of the wing. I was hoping to get the picture to you before plans were published. The wingspan is 20" and the prop 6" carved from pine. Perhaps a balsa prop would be better, but by carving the blades down to 1/32 of an inch this prop is as light as one of balsa. As yet the best flight of this plane has been about 3/4 of a 30' circle, hand-wound. It will certainly do better with two or three hundred turns put in with a winder."

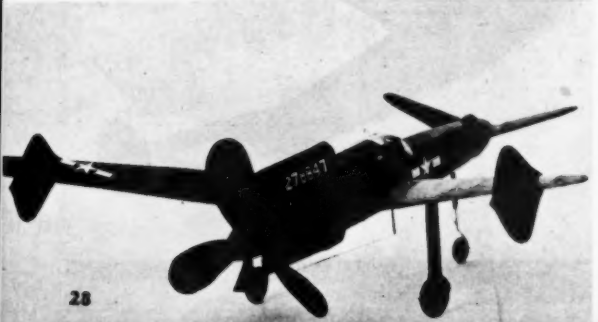
The Stinson Voyager depicted in No. 6 is the work of Bill Brown of 63 So. Mountain Ave., Montclair, N. J., who says: "It has a 33"



No. 3—Control line Hawker Typhoon is the work of Russ Webber



No. 4—Max Schulze's Nieuport 17C-1 is all set for quick action
No. 5—Featuring a photo-finished Curtiss XP-55 by R. W. Prouty



No. 6—Bill Brown's Stinson Voyager has plenty of eye appeal



No. 12—Pesco Special war bond winner by Olson



No. 11—George N. Bruun's Curtiss P-40 is a one man photo-model

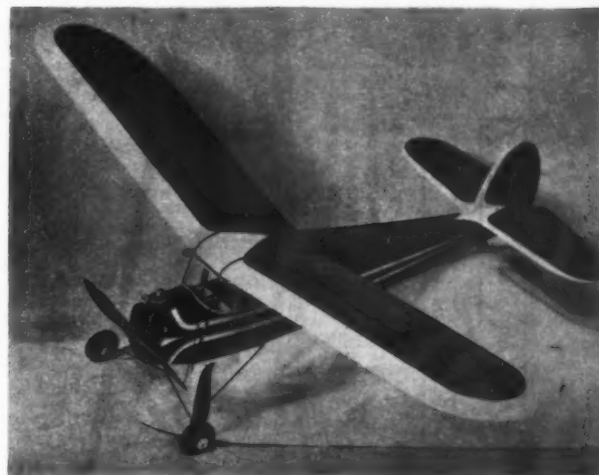
News of model airplane experimenters from all parts of the world

wingspan and although it is a flying model I concentrated on the appearance; as a result it is a little too heavy to obtain good results for any long flights. The plane is planked with 1/8" balsa from nose to rear of cabin. The rest of the plane, except the elevators which are solid balsa, is covered with Silkspan. I took particular pains with the finish. The balsa surfaces are covered with wood filler, two coats of clear dope and five thin coats of colored dope mixed three parts to one of gloss dope. Over it all is a thin coat of shellac. The plane has a dashboard, control sticks and pilot's seat, the doors open (the farthest one in the picture can be seen opened) and it has pneumatic tires.

"The model has the same number of wing ribs as its full size counterpart and the structure follows that of the real ship. It is doped a red slightly darker than vermilion with black trimming and aluminum tubing in parts. The control surfaces are movable. I worked on the plane in my spare time after school and at night and completed it in less than 3 weeks. I'm now working on a 36" scale Thunderbolt and also a 14" solid scale model of the same plane. Needless to say I'm trying to incorporate all the details I can in each. Meanwhile I'm waiting to enter the *Voyager* in a contest if one comes along in this vicinity. I won a first place with a flying scale Curtiss 0-52 in December 1942." Well, you can't win all the time, Bill, but we certainly hope you chalk up another winner.

No. 7 was submitted by Dustin W. Carter, 9533 San Miguel Ave., South Gate, Calif., and shows his 3/4"-1' Bird Biplane. The Kinner engine is built up with moving pistons and the model has movable controls from the cockpit. All instruments contained in the real ship are duplicated in the model. "Dusty" says he has a couple of gas jobs, one of which is completed and the other almost finished. The unfinished one is a scale model of the 1923 Curtiss Flying Racer, and he promises to send pictures upon completion.

George Gumbus, R.F.D. No. 2, Westerly, R. I., sent in No. 8 showing his exact scale model of the famous stainless steel flying-boat, saying: "The model has been flown several times ROG but as yet has not taken off water. The ship is built of 1/8" sheet balsa and (Turn to page 64)



No. 10—Bunch powered Pudgy is an original job by Joe Neil



No. 9—Jim Debyns' photo-model glider is result of teamwork
No. 8—A steel flyingboat exact scale model by George Gumbus

No. 7—"Dusty" Carter's Bird Biplane contains a Kinner engine



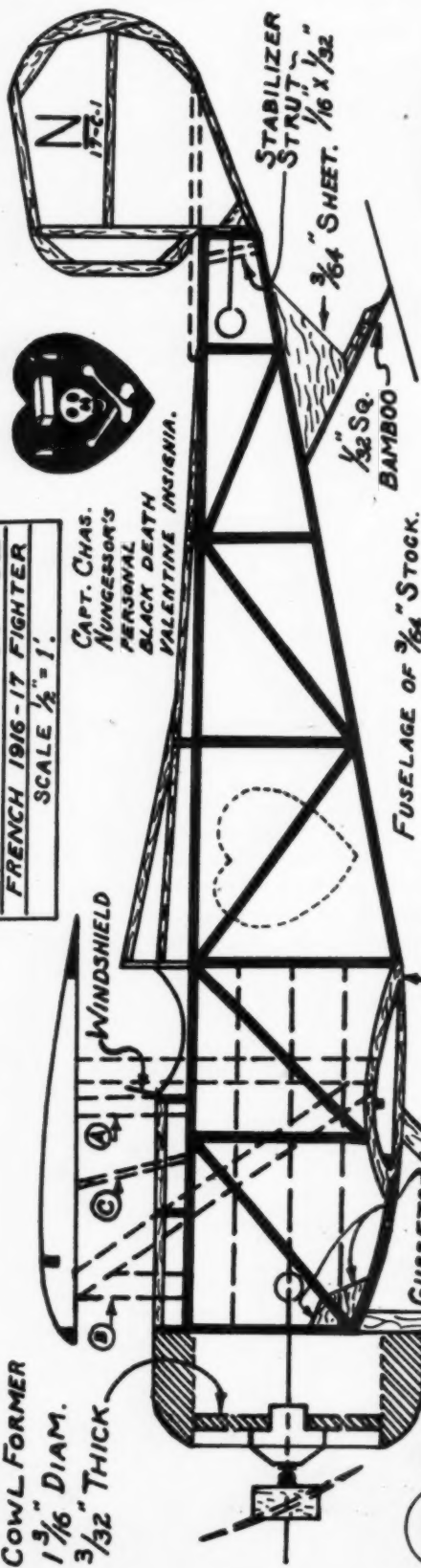
NIEUPORT 17-C.1

FRENCH 1916-17 FIGHTER

SCALE $\frac{1}{2}$ " = 1'

CAPT. CHAS.
NUNGESSOR'S
PERSONAL
BLACK DEATH
VALENTINE INSIGNIA.

COWL FORMER
1 $\frac{3}{16}$ " DIAM.
3 $\frac{3}{32}$ " THICK



REAR MOTOR
HOOK.

PROP.
SHAFT.

HEADREST
FORMER.

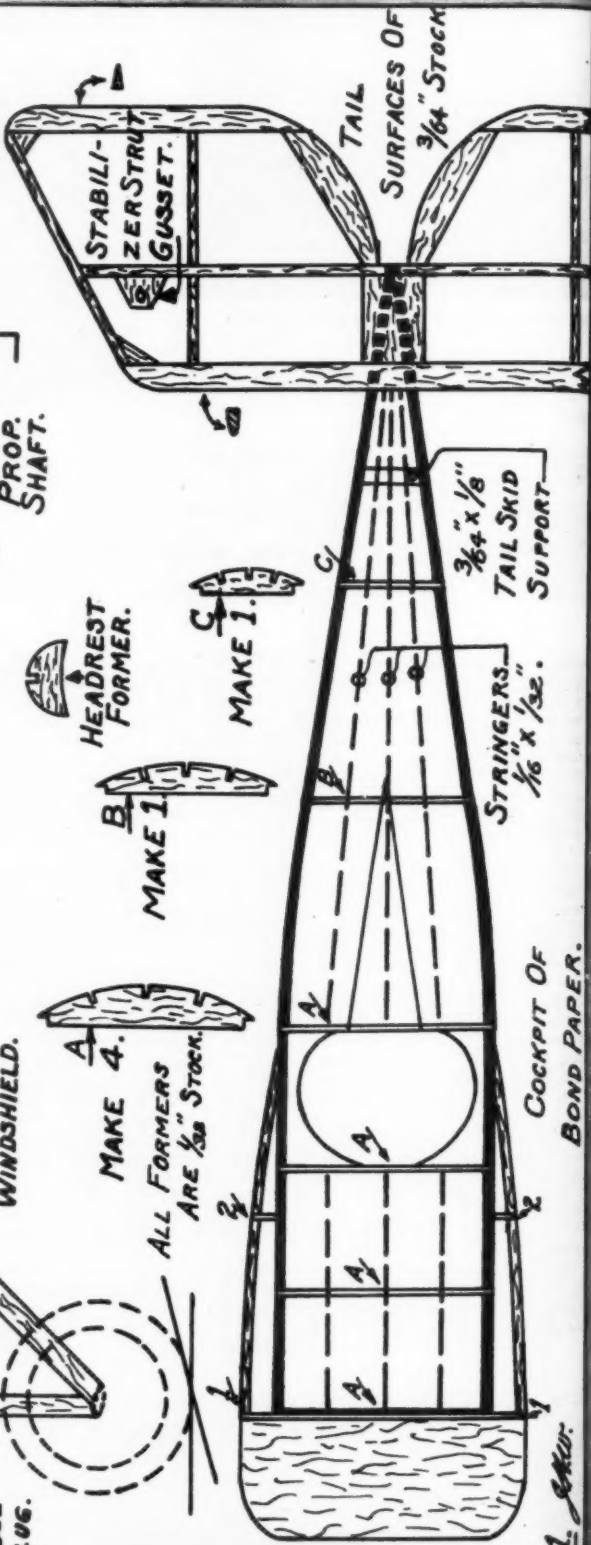
MAKE 1

MAKE 4.

ALL FORMERS
ARE $\frac{1}{32}$ " STOCK.

MAKE 2

MAKE 2



COCKPIT OF
BOND PAPER.

PLATE 1, cont.

by JOSEPH H. WHERRY



NIEUPORT 17

Let's build and fly a Fighter of World War I

ALMOST a quarter of a century ago many fathers of present aces were doing a bit of aerial dueling with the "Hun" of that day. Those sky fighters had none of the safety features of our present day aircraft. Armor plating was at best only an experiment, and the parachute was only for the unfortunate balloon observers. Not until the closing days of the war did an airplane pilot use a chute to save his life. That lucky individual was the great German Ace, Ernst Udet, who lost his life in this war. At any rate, those pilots flew by the "seat of their pants," and one of those sky mounts is our subject for modeling at this time.

The little French Nieuport 17-C1 was a maneuverable but touchy ship. It was a Chasse or Chaser to the French, a Scout or Pursuit to the Yanks and British. It had a nine cylinder Clerget Rotary of 110 hp, could take off and land on small fields, and tear along at a top speed of 115 mph. Some of these little jobs mounted only one synchronized Vickers gun, while others mounted an additional Lewis over the center section. Some were used even against enemy balloons and these carried a primitive rocket arrangement fastened to the interplane struts.

A model builder who likes to possess a collection of famous aircraft cannot afford to miss building a model Nieuport 17-C1 like the real thing which carried Billie Bishop, Nungesser, Navarre, Guynemer and even several Yanks to high adventure on its sometimes flimsy wings.

Our model is small, but if you construct it with care you'll find it a beauty in looks and flight. It is easy to build, and a few evenings will soon complete same. If you wish a larger model, all you have to do is enlarge these plans to the desired scale.

Begin by laying out and thumbtacking fuselage plans (Plate 1) on a smooth board and covering plans with wax paper. Now note! All longerons and crossbraces are shown on plans in black (except where noted) and should be made from 1/16" sq. balsa sanded with fine sandpaper to 3/64" square. A light sanding will bring them down to required 3/64"

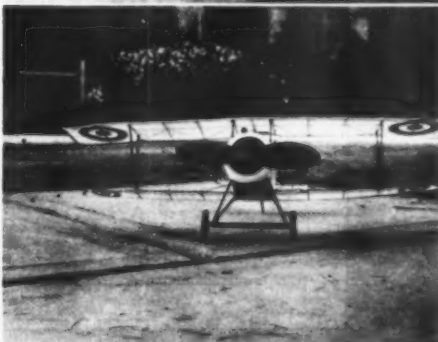
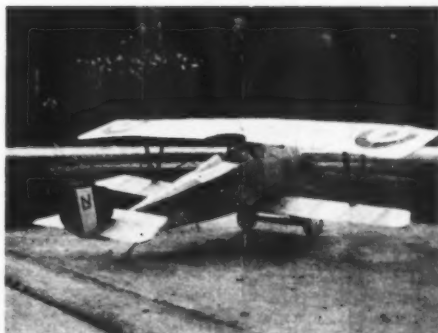
square. Note the lower wing gusset and make it from 1/16" stock sanded to 3/64". Study your plans and you will see most dimensions noted on them. Place the longerons, crossbraces, and gussets in place over plans, making free use of Mom's pins to hold same in place. Cement all joints securely. Both sides are constructed identically.

When sides are completed and dry, remove from plans and join at tail post, inserting at same time the rear motor hook made from No. 10 music wire. With this done, invert the two sides and place over top view. Now place top and bottom crossbraces in place at front of fuselage only and let cement dry firmly. Note! crossbraces are placed top and bottom at every point at which formers are indicated on top view of fuselage (they are omitted on plans for clarity). When dry, remove assembly from board and add formers (all of 1/32" sheet balsa) to top and sides. Now prepare stringers of strips 1/16" by 1/32" and cement in notches of same dimensions cut in formers. The cockpit is cut from bond paper and cemented in place overlapping formers and longerons. Construct tail skid as indicated on plans, and cement to the tail skid supports which are placed between bottom longerons as indicated on top view.

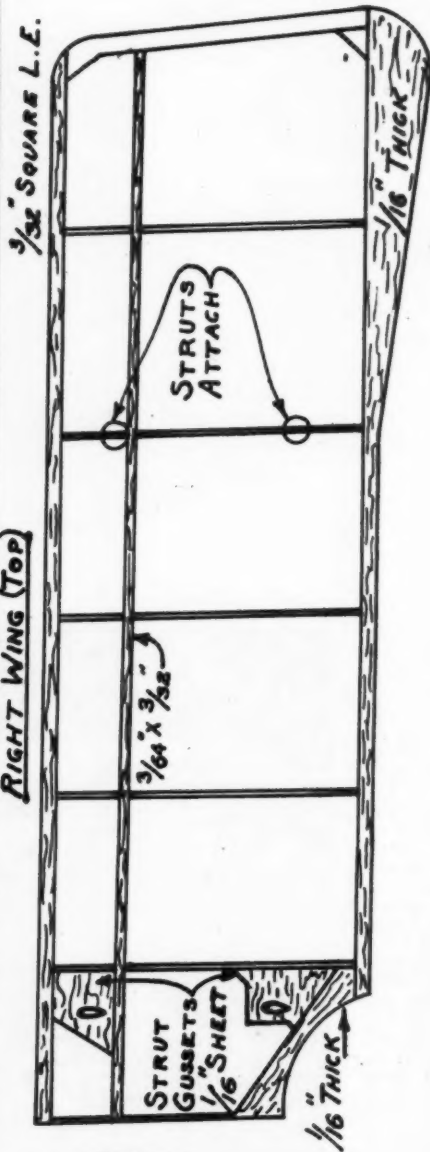
Now construct stabilizer and rudder over plans in same manner as fuselage sides. You may wish a complete stabilizer plan; if so, trace right half on tracing paper, invert tracing, retrace and pin in place on your work board. Tail surfaces are also made of 1/16" stock, and sanded with fine sandpaper. Streamline all tail surface outlines as shown in small crosssections on plans.

Wings are easily made directly over plans from stock of the size indicated on plans. Make drawings of the left wings as you did the left half of the stabilizer. First pin ribs in place, then add trailing edges, wing tips, the strut gussets (top wing only as shown), the spars, and finally the leading edges. When wings are dry, remove from plan and sand all lead-

(Turn to page 42)

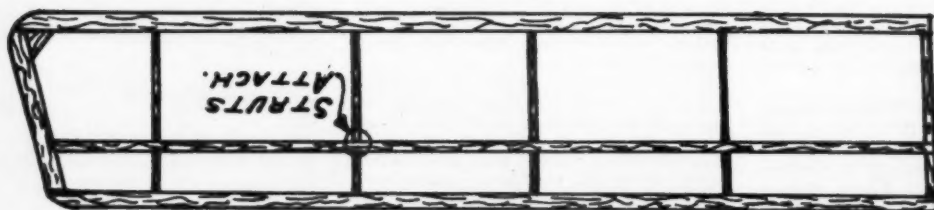


RIGHT WING (TOP)

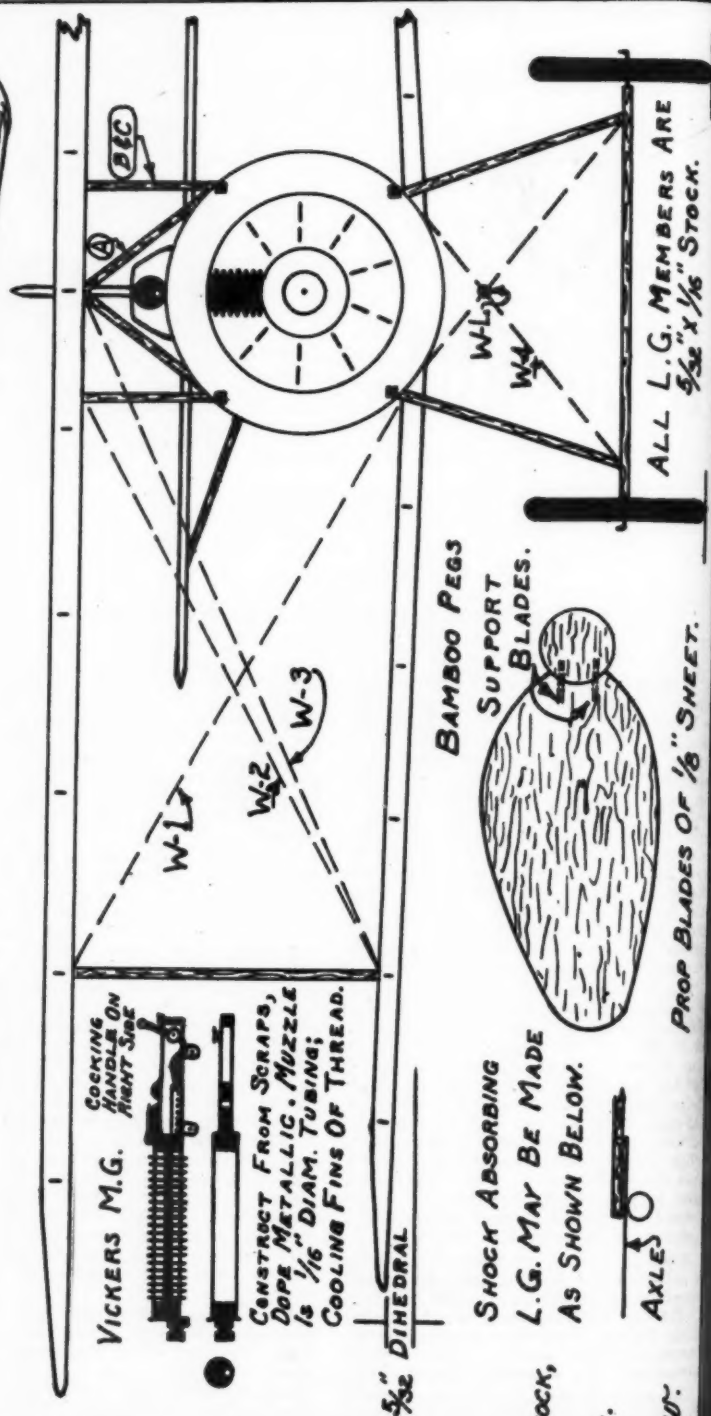


MAKE 2 - $\frac{1}{32}$ " STOCK.

MAKE 10 - $\frac{1}{32}$ " STOCK.



LOWER RIGHT WING



BAMBOO PEGS

SUPPORT BLADES.



PROP BLADES OF $\frac{1}{8}$ " SHEET.

SHOCK ABSORBING L.G. MAY BE MADE AS SHOWN BELOW.



AXLES

MAKE 2 - $\frac{1}{16}$ " STOCK,

8 - $\frac{1}{32}$ " STOCK.

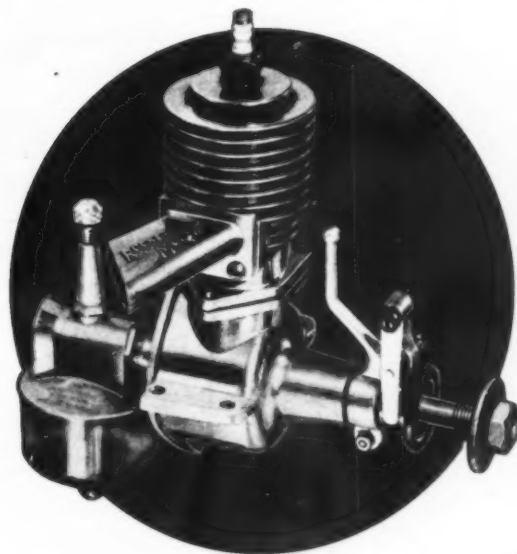
PLATE 2, GAW.

ALL L.G. MEMBERS ARE $\frac{5}{32}$ " x $\frac{1}{16}$ " STOCK.

MODEL MAKERS INSIST UPON

Dependable POWER

Rocket
ENGINES
FORMERLY THE RAY MOTOR CLASS
C



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PRODUCT OF

Corporate Products Inc.
DETROIT 26, MICHIGAN



Early NIE XVII had spinner, 110 hp LeRhône, transparent center section



WORLD WAR

by **ROBERT C. HARE**

ONE of the most successful pre-World War I airplanes was the Nieuport monoplane. A familiar sight at all flying meets from 1910 to 1914, it exemplified the ideas of one of a budding group of aviation pioneers who were dedicated to the development of aerodynamic efficiency in their designs. The Nieuport monoplane was the contribution of its manufacturer, Edouard de Nieuport, who spelled his company's name *Nieuport*, the way his own was pronounced.

One of his greatest contributions was the idea of the fully covered fuselage. On the Nieuport monoplane he calculated this feature added some 15 mph to the machine's top speed. His contemporaries, such as Bleriot or Grade, were satisfied to cover fuselages of their creations as far back as the rear of the cockpit and leave the structure from there to the rear exposed to the wind. This crusade for higher efficiency in aeronautics brought

(Turn to page 36)

NIE XVII bis fitted with 130 hp Clerget motor had faired fuselage sides



Mr. Hobbycraft
Dealer:



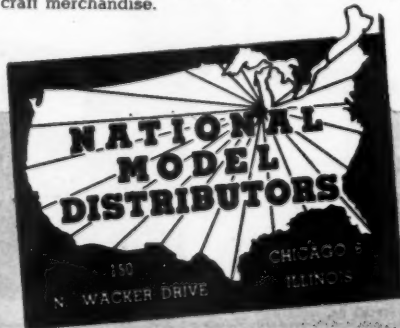
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The spring of 1914 saw de Nieuport busy at work on an entirely new type airplane which he called the "1-1/2 plane." Although it had all the appearances of a bi-plane the little ship actually was a parasol monoplane in which the external trussing of the wing was given an airfoil shape and made to contribute to the total lift. Monoplanes of that period either were trussed with heavy struts including a lower spanwise member analogous to an exposed lower wing spar, or wire braced. In giving the lower truss a set of ribs and covering de Nieuport produced a type we call sesquiplane.

The 1-1/2 plane idea had some very definite advantages. The parasol wing gave all the benefits of the high wing monoplane, while the narrow chord lower half-plane did not appreciably reduce the excellent vision provided by the location of the main supporting surface. In addition, the resulting structure was much simpler to build than a conventional biplane in which the area of the wings was equal; it offered less resistance yet was just as strong.

This first 1-1/2 plane Nieuport was known as the Flat Wing because of the character of the airfoil section used. One of the earliest gun carriers, the gunner of this two seater rode in the front cockpit. Standing up with his head sticking through a round hole in the center section of the upper wing and armed with a Lebel rifle, he slugged it out on at least even terms with many similarly manned German two seaters.

Answering a whim for a snappy single seater, de Nieuport brought out a second 1-1/2 plane somewhat smaller than the Flat Wing and powered it with an 80 hp le Rhone rotary engine. This particular model evolved into the Nieuport XI pursuit which helped defeat the Fokker monoplanes later in 1915.

The Nieuport XI spawned France's first crop of aces, just as the Fokker E. I. provided a useful weapon for Germany's first great aerial warriors. Sons of the Tri-color such as Guynemer, Nungesser, de Lage, and the Americans who formed the Excadrille LaFayette flew into battle with the Nieuport XI. The XI was equipped with a single machine gun mounted on the upper wing firing over the top of the propeller.

Once having seized the initiative with aid from the Nieuport XI, the call went out to manufacturers for a plane that would enable the Allies to maintain the advantage then enjoyed over the German Imperial Air Service. Edouard de Nieuport and his excellent design organization answered with the Nieuport XVII, generally conceded to have been the best pursuit ship of the period.

The Nieuport XVII

Listed on official French records as the Nie. XVII C.I., "C.I." indicating Chasse (chaser) 1 seat, this was one ship the Allies couldn't get enough of and the Germans fervently wished had never been designed. The British RNAS supplemented their Sopwith Triplanes with hundreds of Nieuports just as the Royal Flying Corps flaunted its many squadrons of XVII's against the earliest attempts at organized Hun tactics, and came out on top. Billy Bishop, among other notables of the aerial war, won his spurs behind the stick of a XVII. Russia

(Turn to page 38)

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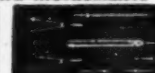
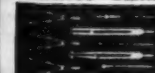
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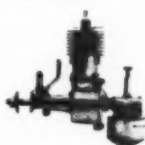
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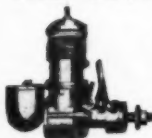
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and Italy, as well as France, chose the XVII as standard equipment for their pursuit squadrons, adding to the general discomfort of the enemy on their particular battlefronts.

Design and Construction

Two outstanding features of the Nieuport XVII characterized it from other airplanes of the same period. First, the narrow chord lower wing, area of which constituted only about one-third of the total supporting surface. Its simple single spar structure permitted the second characteristic, the "V" shaped interplane struts, one of which was provided between each right and left pair of wing panels. The upper, or main plane, a two piece structure joining over the fuselage centerline, was swept back in plan, but carried no dihedral. A separate center-section was not included. The two "T" beam spruce spars in each upper panel carried 11 full ribs which consisted of plywood webs and spruce capstrips. The leading edge was straight grained spruce milled to conform with the rib nose shape, while the trailing edge was a strip of the same material tacked and bound to the rib ends. Each panel was internally braced with steel wire and tubing compression members.

Wood framed ailerons of tapering chord increased the basic wing chord at the a torque tube running through the upper wing behind the rear spar, and the upper wing behind the rear spar, and connected through bell cranks and push-pull rods to the control stick. This system, you will recall, was later copied in the Pfalz D.III (MODEL AIRPLANE NEWS for June 1945).

Nine full ribs in each lower plane were attached to the single spar. Leading and trailing edges were similar to those of the upper wing except that no ailerons were fitted. "V" shaped interplane struts made of spruce were attached to steel fittings in the upper and lower planes. Sheet aluminum fairings covered the strut attachment fittings on the lower wing.

The typically Nieuport empennage consisted of a trapezoidal horizontal stabilizer of high aspect ratio and an unbalanced elevator with its trailing edge cut out to permit rudder travel. No fixed vertical fin was fitted but the rudder was aerodynamically balanced. Elevator and rudder control was obtained by stranded cables connected to the stick and rudder bar.

Simplicity and lightness were design keynotes in the XVII fuselage. Four spruce longerons and numerous uprights and crosspieces formed the basic structure. The upper longerons were straight aft of the second fuselage upright while lower longerons curved sharply upward from the cockpit floor to the engine bearer plate. A curved metal cowl streamlined the upper deck forward of the cockpit. A framework of formers and stringers faired the fuselage top rearward to the tail. Fuselage vertical and cross struts were socketed in sheet steel stampings which incorporated lugs for attaching diagonal steel wire bracing.

Drawn aluminum alloy tubing landing gear struts were connected by a channel sectioned aluminum alloy spreader bar. Axles were made of steel tubing mounted on rubber shock cord and strut sockets were steel stampings. A steel leaf spring tall skid was mounted on a plywood faired tripod of steel tubing.

Except where otherwise noted, the entire ship was covered with fabric and doped.

(Turn to page 40)

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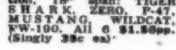
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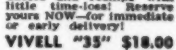
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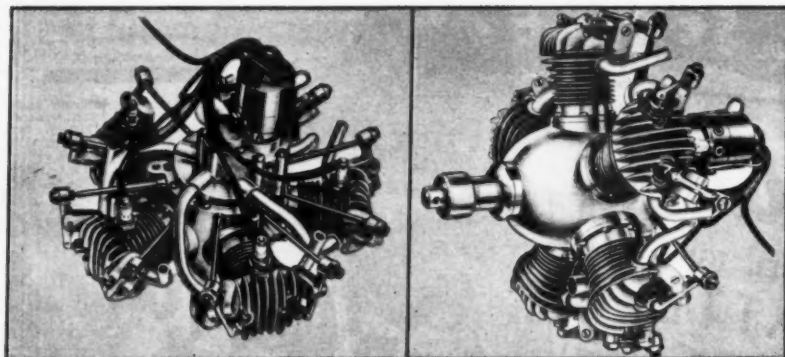
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Variations of the XVII

The Nieuport XVII was produced in two distinct models, the basic XVII, and the XVII bis. While the design and appearance of the two basic and two bis models was identical, they varied dimensionally and were fitted with different power plants. Outwardly, the basic XVII was distinguishable from later models by its flat-sided fuselage aft of the cockpit and the transparent windows in the centersection. The basic XVII was fitted with both 110 and 120 hp le Rhone rotary engines. In some instances the basic 1210 hp model was fitted with an opaque, fabric covered centersection.

The XVII bis models were equipped with 120 and 130 hp le Rhone and Clerget engines respectively and were characterized by stringers which faired the fuselage sides. The centersection of each was opaque. Clerget powered bis models, constructed in large numbers for the RNAS, displayed an unfaired tail skid. Some of the early basic 110 hp models came equipped with a large aluminum spinner attached to the propeller.

Armament also varied between models. Earliest examples of the 110 hp basic XVII went into service before a successful synchronizer was developed by the Allies. Consequently, the centersection mounted machine gun was the only armament fitted to many ships of this type. Later, on the basic 1120 hp model, a synchronized Vickers was installed on the cowl in front of the pilot. Although this practice was continued through the bis models, the British often fitted their 130 hp Clerget machines with a centersection mounted Lewis gun.

Dimensions and Performance

The data given below was obtained from the official archives of the Nieuport company. Dimensions are listed in the original metric system for sake of accuracy.

ITEM	BASIC	BIS
Span upper wing	8m, 300mm	8m, 160mm
Span lower wing	7m, 800mm	7m, 800mm
Chord upper wing	1m, 230mm	1m, 233mm
Chord lower wing	730mm	720mm
Dihedral upper wing	none	2° 30'
Dihedral lower wing	3°	2° 30'
Total wing area	15m, square	15m, square
Length overall	5m, 760mm	6m, 000mm

Often referred to as the 15 meter Nieuport because of its wing area, the XVII in its various models was highly regarded because of its excellent all around performance. Judged by modern standards of fighting ships detail performance of the XVII was relatively poor. But the ship was available to the Allies at a time when it was needed and sufficiently excelled contemporary Germany types to be an important factor in contributing to Allied superiority for nearly a year.

Despite its good points, the Nieuport XVII was finally outclassed by newer and more powerful types and passed into the pages of history. Military aviation however found a true and staunch supporter in Edouard de Nieuport. Designs emanating from the organization he founded in 1910 will continue to reflect, in the future as they have in the past, the leadership and initiative demonstrated in the Nieuport XVII.

PHOTO CREDITS

Page	Source
6	Douglas Aircraft Co.
6	Official U. S. Navy
	A. V. Ludwin
17	All Air Technical Service Command
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25	2nd from Bottom, Press Association
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Nieuport 17

(Continued from page 31)

ing and trailing edges and tips to the proper streamline section. Join the two halves of the upper wing together and note that it lacks dihedral.

The author wishes to draw to the attention of any tyros who may build this Nieuport that the inverted camber or concave outline on bottom surfaces of the ribs may cause you difficulty when covering wings. Therefore, beginners may simplify construction by making bottom surfaces of the ribs flat as shown in side view on Plate 1.

Landing gear struts are next and are made with reference to both side and front view. If the model is to be flown, you may dowel the struts to the fuselage at point of attachment by using $\frac{3}{8}$ " lengths of music wire. This method with a liberal amount of cement proved to be effective on the author's model. Wheels are made of $\frac{1}{8}$ " sheet balsa with a small washer cemented to sides.

Because the side view shows no dihedral for the lower wing, you may cut the centersection struts A, B and C directly to size from the front view. Note width of struts on side view where all struts are shown by broken lines. Observe that struts A angle from top longerons so as to meet and join top wing at center rib. Struts B and C are exactly vertical and cemented to the strut gussets.

With centersection struts in place, the fuselage and all parts may be covered. The author's first Nieuport featured an olive drab fuselage, neutral colored wings and elevators, and a bright red nose. The struts were natural wood color and the tail skid, machine gun and other small

details black. The Nieuport shown in accompanying photos was completely covered with very lightweight white tissue. This can be varied to suit the taste of the individual but a light grade white tissue will simulate the color scheme used by the French Ace, Capt. Nungesser, and at the same time provide the lightness desired in a flying model.

To secure a successful covering job on wings with inverted camber, you must dope the tissue to the bottom of each individual rib. If the wing of your model has been made flat on the bottom, merely dope the tissue to the outline of the wing; top covering can be accomplished by doping to the outline only. The tail surfaces are covered with one piece per side, likewise doped to the outline only. Cover the fuselage sides with one piece between Formers 1 and 2, one piece between Former 2 and the vertical at rear of cockpit, and one piece from that point to rear of fuselage. Cover bottom with one piece leaving open the portion aft of the crosspiece just forward of the tail skid to service the rubber motor. On the top of fuselage, cut carefully to fit around struts, using one piece forward of cockpit and one piece aft.

In making the headrest, construction is optional. You may use the small headrest former and a bondpaper cone or you may carve from a block of soft balsa. After covering, cement in place.

Assemble model after spraying all parts with atomizer. Doping is not recommended because of additional weight.

At the time of attaching lower wing it is important to make certain that inci-

dence is exactly as shown on side view.

Model is now nearly complete, so let's make the cowl from a block of lightweight balsa. Make sure that diameter and width of cowl coincide with plans. First shape cowl perfectly round, then cut exactly in half and hollow each to inside diameter. Now streamline cowl with razor blade and sandpaper. Cowl may now be cemented in place. Make cowl former (1-3/16" diameter and 3/32" thick), cut nose plug hole 1/4" diameter in center, and cement former in place. Make propeller hub and blades according to side view (Plate 1) and blade pattern (Plate 2). Make prop shaft of No. 10 music wire, first putting the nose plug on shaft, then washers, bead, and finally prop itself. With this done, bend front of shaft as shown on Plate 1 and securely cement in hub. Install windshield cut from celluloid, and the stabilizer strut cut to fit between the gusset support (shown on stabilizer plans) and lower longeron as shown on fuselage side view.

Fit prop and nose plug assembly in place, add one loop of 3/16" flat rubber, and your model is ready to test fly. Weights may be placed on landing gear spreader if necessary. Author's Nieuport balanced perfectly and required only a slight downthrust, achieved by inserting small scraps of balsa between nose plug and cowl former at top of nose plug hole.

To simulate metal, use white dope from rear of cockpit forward. Insignia shown in photo on ship's side is that of the French Ace, Nungesser, and is a black Valentine with skulls, etc., in white.

Add French insignia, machine gun, wires, etc., and your Nieuport 17-C1 is complete. Check photos of model and those of real ships for details. Note machine gun on front view plan is on center of cowl, while the one on model is right of cowl. Because armament versions varied, this is left to the individual. The model in photo has a rectangular prop hub, but round hub will more closely resemble the original. Model is exact scale, except for propeller and placing of centersection struts as previously noted.

Remember, in spite of this ship's small size, if you build it right it will fly right. Next month we plan to present a World War I model never before (to author's knowledge) presented to American modelers.

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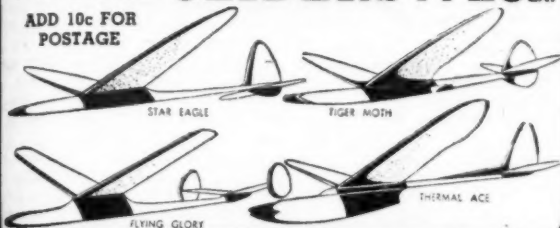
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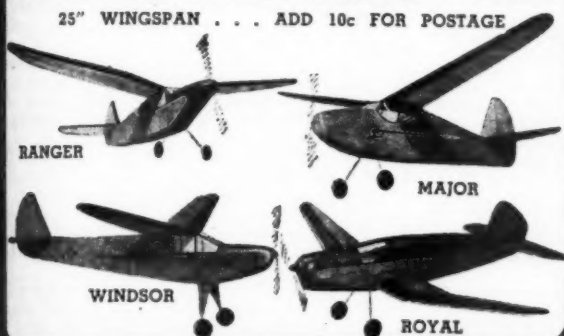
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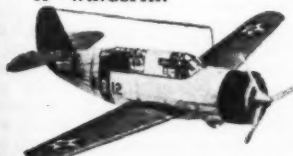
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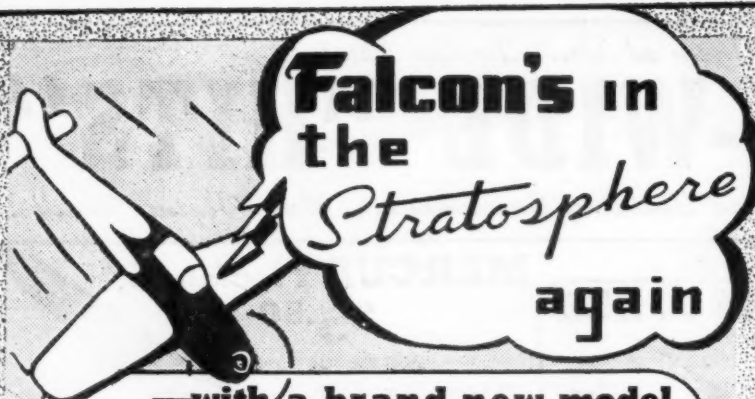
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The Albacore

(Continued from page 19)

more than hold its own in speed contests against planes of the same type. It is a threat at any beauty contest (the original model has a first place to its credit). With an A engine for power it lands slowly enough for even the uninitiated to enter the sport. The construction is really rugged as a glance at the plans will show you, and while not simple, anyone possessing free flight model building experience shouldn't encounter difficulty.

FUSELAGE—The basic framework of the fuselage is a "crutch" of hard 1/8" x 1/2" balsa, built directly on the top view of the plan. This gives a strong rugged frame around which the rest of the fuselage is built. Cement the engine mounts in place while building the crutch. Note that the crutch longerons are not bent together but tapered in thickness as they approach the nose of the ship.

Cut all formers out of 1/16 sheet balsa. If hardwood is used, cut lightning holes in them (see plans). Cement the formers in place. Note that each former is cemented to the front face of the crutch cross-pieces. At stations 5.450 and 6.700 1/4 sheet pieces are cemented to the formers as shown in the sectional view. The upper wing spars are cemented to these pieces so make sure they are firmly in place. Brace with 1/8 x 1/2 members running from the crutch crosspiece to the spar and 1/4 sheet member intersection. The 1/8 by 1/2 longerons should be sanded to the contour of the formers. Start the planking from each side, and work around toward the top and bottom. Finish planking the bottom first, leaving most of the top open so the controls and landing gear can be installed. Bevel one edge of each plank before cementing in place. Taper the planks toward the tail. Install the landing gear (tailwheel included) and the control plate. Cement stabilizer in place and hook up the controls. Note that the control lines run out the starboard side of the fuselage.

The cowl and spinner are turned out on a lathe. Cement the exhaust stack in position on the cowl (see right hand view of cowl). Cut an opening in the bottom of the cowl to fit the cylinder of your individual engine. Bolt engine in place and fasten the coil and condenser in place. The weight of your engine will determine the position of these two accessories. At this stage of construction it should balance at its c.g. so arrange your ignition units accordingly.

Complete the planking of the fuselage. Make a wooden form for the cabin of scrap balsa and form the cabin either from Lucite or Plexiglas or from celluloid by means of the Cello-mold process. The cabin of the original model was formed by Cello-mold and it worked out very well.

WINGS—Wing construction is orthodox and should give the builder no trouble. The lower wing should be cemented in position before finishing the planking. Some difficulty will be encountered in covering the wing but this is unavoidable. Make sure wiring is well soldered, coil and condenser securely in place, and wing and landing gear secure before finishing planking the ship. It is difficult to make internal repairs on a ship with a planked fuselage. Batteries are readily accessible in the torpedo.

The upper wing is covered before cementing it in place. It is a good idea to cover and paint the lower wing before putting the top wing in position as it is exceedingly difficult afterward.

All ribs are 1/16 sheet balsa. If hardwood is used, cut lightning holes. Ribs and other sheet members should be cut out before starting construction.

Build the outline of the wings first—that is, the leading and trailing edges and tips. Cement the lower spar in place and cement the ribs in position when the assembly has dried. The upper spar is first cemented at the tip and when this joint has set firmly it is cemented to the other ribs.

Cover the section from the leading edge back to the top spar with 1/32 sheet balsa. This is done by cementing the edge of the balsa sheet to the leading edge of the wing. When the cement has dried, coat each rib and spar with cement and fasten the sheet down to the ribs and spar with pins.

The stub spars and reinforcing members are cemented in place after the wings are cemented to the fuselage. There is 7/8 dihedral under the lower wing and 15/16 under the upper wing. The stub spars and reinforcing members run unbroken between wing halves to assure maximum strength. Sand structure lightly.

Silkspan is the covering material; thick dope the adhesive. The Silkspan is applied wet. When covering upper surface of a wing, dope tissue only to root rib, the leading and trailing edges and the tips. This permits the tissue to tighten evenly over the entire surface of the wing as it dries. Since a flat bottom airfoil is used, the lower surface of the wing may be covered in the same way. When covering undercambered wings it is necessary to dope tissue to each rib to preserve the wing section. Wings should be given four or five coats of clear dope. Dope only one panel at a time and pin or weight down the leading and trailing edges to prevent the wing from warping. Incidentally, a few good heavy volumes come in handy for this purpose. Matched books, such as encyclopedias, are useful in raising wing panels to the right height when putting dihedral in a wing. Protect the books from dope or glue stains with waxed paper.

ENPENNAGE—Stabilizer and rudder construction is conventional. Note that the stabilizer and rudder have streamline sections.

Material used in construction is noted on the plans. Build both the stabilizer and rudder directly on the plan. Ribs are of 1/16 x 1/4 stock, sanded to shape after assembly. The elevator and horizontal fin and the rudder and vertical fin are built separately. Brass strips 1/4" wide serve as a rudder hinge while strips of cloth serve as elevator hinges. Cement the bellcrank to the first rib on either side of the centerline of the elevator, and after sanding the entire structure lightly cover it with Silkspan. Cover the rudder and vertical fin similarly and give both four or five coats of clear dope.

Cement the stabilizer to the fuselage, link up the controls, and when the planking is finished cement the rudder and fin in place. Make sure these surfaces are at right angles to one another (when viewed head on). Put a fillet of cement at each joint. This, incidentally, is a good thing to do at all joints.

TORPEDO—The torpedo is turned out on a lathe. When finished it is split apart and a recess hollowed out for the two pen cells. Brass contact plates should be cemented at either end of the recess. The necessary lead-in and lead-out wires are concealed in the torpedo mounting fixtures. Cement dowels in one half of the torpedo and drill corresponding holes in

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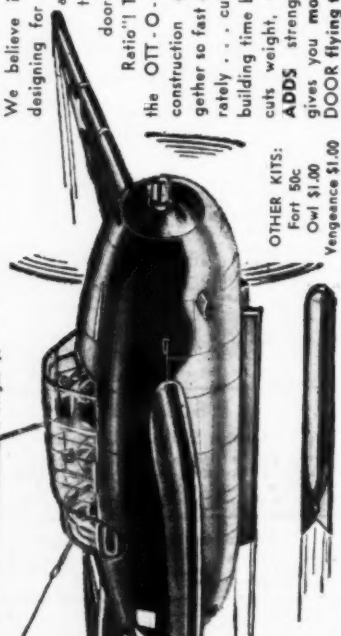
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the other half. To mount the torpedo push the two halves together and place in the mounting fixtures. Rubber bands hold the torpedo to the rack and also keep the two halves together.

LANDING GEAR—This is formed from 3/32 spring wire. The fairing may be either balsa or stiff 2 ply drawing paper. The landing gear is cemented firmly to the floor of the fuselage and a film of cement spread over it. The base block for the control plate is then cemented in position on top of this, resulting in a secure rigid assembly. The tail wheel is of the type made especially for gas models. It is mounted in a hardwood block as shown.

CONTROLS—The standard U-Control system is used except that the lines run out the starboard side of the fuselage. The control rod is of 1/8D soft aluminum. The control plate is cut from 1/16 sheet aluminum; the bellcrank is bent from 1/16D spring wire. A third line for motor control may be used if desired.

FINAL ASSEMBLY—When the wings and tail surfaces have been cemented in place the interplane struts, landing and flying wires, radio antenna and aircscoops are added. The latter are scrap balsa. Landing gear fairings are also added.

The fuselage and torpedo are finished with a good grade of boxwood primer. At least ten coats should be applied, sanding after every two or three coats and finishing off the last with #420 wet-or-dry sandpaper with plenty of water.

Color scheme of the fuselage is white below the T.L., blue-gray above. Since the wood filler specified above is a gleaming white, the bottom of the fuselage need not be painted. The undersurface of the lower wing, stabilizer and landing gear fairing is also white, everything else is blue-gray. The torpedo is silver, the propeller black. The cabin framework is represented by strips of black tissue doped to the celluloid. Don't use cement as this smears and renders the celluloid opaque.

You may be able to buy a three bladed gas prop; we had to make one using three of the blades of two X-Cell U-Control props.

A Phantom P-30 powered the original model, so fastening on the spinner was no problem since the crankshaft of this engine is internally threaded to receive a spinner screw. With other engines a force-fit spinner must be used.

Add the correct decal insignia and lettering ("Scoremarker" decals of ships sunk, bombing missions, etc., greatly increase the ship's appearance).

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Catapult takeoffs are the acme of scale flying. We used a catapult designed by H. Seward Dion. For summer flying, mount your *Albacore* on floats and enjoy the unbounded joy of seaplane flying. The author will be glad to answer any questions on construction and very pleased to hear from those building the model.



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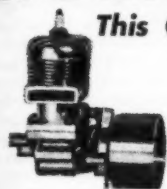
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Plane On the Cover

(Continued from page 25)

The 2100 hp of each engine may be increased considerably for short bursts of speed by water injection equipment which keeps the cylinders cool while the manifold pressure is pressed upward.

The next problem was to design the smallest practical airplane behind these two engines and a glance at the cover will show how successful the designers were. The pilot is located directly between the two engines and behind the long, tapered nose which houses the nose wheel. The fuselage slants away from his headrest toward another point at the extreme tail. Single vertical and horizontal tail surfaces are used, the fin and rudder being extra large to provide single engine control. Thus, if one of the big engines is knocked out, the pilot does not have to fly for long, fatiguing hours holding hard opposite rudder to counteract the unsymmetrical thrust produced.

The wings of the Tigercat are not beautiful but they exhibit Grumman's genius for practical design—does it do the job, that's the question uppermost in his mind as he sketches away at his design board. Wing design of the Tigercat was difficult. The biplane characterized the Navy fighter plane for many years because it was the only method by which required area could be crammed into the necessary short wingspan, due to restricted deck space aboard carriers. The monoplane finally proved itself when airfoils were created with greatly increased lifting ability, thereby providing the required lift with only one short wing instead of two.

But when Grumman tackled the twin engine problem he knew he had a bull by the tail. Increased wing area was necessary, there was no use denying it. So Grumman increased the wing dimensions longitudinally instead of latterly, thereby providing the required additional area without sacrificing precious span. That's how the stubby, boxlike wing of the Tigercat was born. And as if that weren't enough, he went one better and provided folding wings, permitting close stowage on deck and below on the hangar deck. As distinguished from the famed Hellcat wings which fold aft and alongside the fuselage "butterfly" fashion, the big Tigercat folds them straight up and in. And another big change is the use of hydraulic power for wing folding on the FTF, replacing the crewmen required to snap the Hellcat's wings in position.

Construction of the Tigercat is unique and something you might expect from the guiding hand of Roy Grumman. The principal longitudinal member of the plane is a heavy channel-section extruded keel, not on the bottom or sides of the fuselage as the trained engineer might expect, but along the top surface. Shaped in an inverted V section, the keel extends from the pilot's headrest back to the top of the fin and provides a literal "backbone" which no degree of rough deck landings will ever snap in two.

Tail surfaces are full cantilever and the horizontal surfaces are placed well forward, the trailing edge of the elevator falling on a line with the rudder leading edge, thereby eliminating the problem of "cutouts" for control movements and providing maximum amount of area for control in the smallest possible span.

The Tigercat is produced in two versions: the FTF-1, a standard single seat fighter version; and the FTF-2N, a special two seat night fighter type. Actually there is no structural difference between

the two, for in the "day" single seat version the radar operator's compartment is filled by a large auxiliary fuel tank providing greatly increased range. As a matter of fact a 300 gallon droppable auxiliary fuel tank may be mounted under each wing, giving extremely long range to this newest Jap killer.

The Tigercat design, in addition to the above variety of tactical installations, is extremely flexible and it can be converted into a torpedo plane by the simple task of attaching a full size marine torpedo to the fittings provided. Picture this speedy fighter plane with a torpedo under its belly and you have a portrait of the world's fastest torpedo plane, more than 100 mph faster than the swift and deadly Grumman TBF Avenger!

The Tigercat is plenty versatile in the speed department, too. The Navy restricts any mention of its top speed but does admit that the F7F is "faster than anything the Japs have" at sea level where it is at its best. Its supercharging equipment, however, gives it a speed in the "425 mph class" at its critical altitude. But the climb department is where the Tigercat excels for the Navy openly admits that it is the fastest climbing airplane in the Navy, capable of climbing better than a mile-a-minute, which is pretty fast going straight up!

The F7F is almost half again as heavy as the F6F Hellcat yet has twice the power, giving some indication of its vastly increased performance. Yet with all this speed and climb it can slow down to 80 or 90 mph, its stalling speed. Such speed versatility is the answer to Jap tactics and a sudden slowing down is frequently more effective than a tremendous burst of speed.

Exact armament aboard the Tigercat is still restricted Navy information but it does carry heavier firepower than either the Hellcat or the Vought F4U Corsair, our present standard carrier fighters. And in addition to a staggering array of machine guns and cannon it can be equipped to carry 4000 lbs. of bombs under its wings, another versatile version of this amazing warplane. Standard, too, are provisions for mounting aircraft rockets.

MODEL AIRPLANE NEWS was privileged to attend a secret showing of the Tigercat many weeks ago and was astounded by the display of speed, power, climb and maneuverability put on by "Corky" Meyers, Grumman test pilot. Steep dives ended in dashes across the field at seeming shoulder-height and observers were literally vibrated in their boots by the noise and roar of the wind as the sleek blue shark shot over. On hand for the display was the first complete squadron to be equipped with the Tigercat. Commanded by Maj. Henry S. Miller, the Marine Corps unit was on hand with a dazzling display of formation flying and combat tactics. Under the watchful eye of Grumman and Swirbul, the Marines climbed and dived in formation and demonstrated beyond all doubt the superior power of these new weapons.

The Tigercat, however, was specifically designed for carrier deck use and the giant 45,000 ton U.S.S. Midway class carriers will make ideal floating bases for the twin engine craft. Several of these monster carriers, largest and most powerful ever built in this country, have been launched and may soon be in action.

The mighty B-29s are destroying Jap industry, and when the signal is given to clear the beachhead and prepare the way for the invasion boats, you can bet the F7Fs will be in the lead spitting a new kind of death at the enemy.

2 GREAT JEEPS

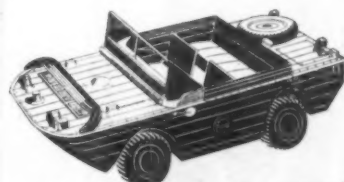
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NATIONAL RECORDS

(Concluding list begun in last issue)

GAS RECORDS ESTABLISHED UNDER WAR TIME RULES

Gas, R.O.G., Class A

		Average
<i>Junior:</i>	Edward Keck Rochester, N.Y.	5:22.6
<i>Senior:</i>	John S. Burke Piedmont, Calif.	1:21.8
<i>Open:</i>	Alfred H. Hovespian Berkeley, Calif.	4:17.9

Gas, R.O.G., Class B

	Average
<i>Junior:</i> Dean Montagne Oakland, Calif.	4:25.7
<i>Senior:</i> Milton E. Taylor, Jr. Oakland, Calif.	8:03.7
<i>Open:</i> Donald K. Foote Oakland, Calif.	2:46.3

Gas, R.O.G., Class C

	Average
<i>Junior:</i> Richard Bartolucci Sacramento, Calif.	7:36.0
<i>Senior:</i> Don Roddick Oakland, Calif.	7:52.4
<i>Open:</i> George Reich Cleveland, Ohio	11:51.4

Gas, R.O.W., Class A

		Average
Senior:	Jack Dyer Oakland, Calif	0:04.1
Open:	Ray Acord Los Angeles, Calif.	2:01.9

Gas, R.O.W., Class B

		Average
Senior:	Jack Dyer Oakland, Calif.	1:47.2
Open:	Ray Acord Los Angeles, Calif.	2:02.8

Gas, R.O.W., Class C

	Average
<i>Senior:</i> Bud Romak Oakland, Calif.	2:50.6
<i>Open:</i> Russell Watkins Oakland, Calif.	1:33.9

INDOOR

Stick Model, H.L., Class B

	Junior:	Martin Friedland	18:55.5
		Philadelphia, Pa.	
	Senior:	Alvin Rohrbaugh	21:38.0
		New Haven, Indiana	
	Open:	Merrick S. Andrews	19:10.1
		Philadelphia, Pa.	

Stick Model, H.L., Class C

	Junior:	R. Jagiello	19:17.3
		Chicago, Ill.	
	Senior:	Milton Huguelet	23:49.0
		Chicago, Ill.	
	Open:	Merrick Andrews	26:39.0
		Philadelphia, Pa.	

Stick Model, H.L., Class D

	Junior:	Paul B. MacCreedy, Jr.	6:14.0
		New Haven, Conn.	
	Senior:	Alfred Lehmberg	10:05.2
		San Antonio, Texas	
	Open:	Dick Everett	9:54.2
		Hampton, Va.	

Stick Model, R.O.G., Class A

	Junior:	Arthur Saltzman	10:09.0
		Philadelphia, Pa.	
	Senior:	Milton Huguelet	12:23.5
		Chicago, Ill.	
	Open:	Hyman S. Oslick	15:32.0
		Philadelphia, Pa.	

Stick Model, R.O.G., Class B

	Junior:	Martin Friedland	17:00.0
		Philadelphia, Pa.	
	Senior:	Martin Friedland	19:56.5
		Philadelphia, Pa.	
	Open:	Merrick Andrews	15:11.3
		Philadelphia, Pa.	

Stick Model, R.O.W., Class A

	Junior:	Arthur Tully	2:56.0
		Boston, Mass.	
	Senior:	Ted Gonsoph	10:51.0
		Philadelphia, Pa.	
	Open:	William Hawkes	10:10.6
		Philadelphia, Pa.	

Stick Model, R.O.W., Class B

	Junior:	Arthur Saltzman	14:10.2
		Philadelphia, Pa.	
	Senior:	David Call	15:49.0
		Kenmore, N.Y.	
	Open:	David L. Call	16:32.0
		Kenmore, N.Y.	

(Turn to page 52)

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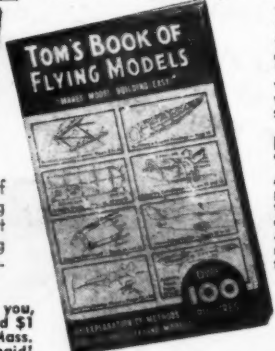
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Junior:	Otto Curth	Chicago, Illinois	:44.7
Senior:	Robert Dehatty	Chicago, Illinois	:48.3
Open:	Leg Vartanian	Chicago, Illinois	:54.3

Glider, H.L., Class B

Junior:	Otto Curth	Chicago, Illinois	:44.7
Senior:	Robert Dehatty	Chicago, Illinois	:50.3
Open:	Joseph Matulis	Chicago, Illinois	:39.2

Fuselage, R.O.G., Class B

Junior:	H. Kaczynski	Detroit, Mich.	12:42.3
Senior:	David Call	Kenmore, N.Y.	15:09.3
Open:	Walter Erbach	Sheboygan, Wis.	15:35.0

Fuselage, R.O.G., Class C

Junior:	R. Jagiello	Chicago, Illinois	11:32.3
Senior:	Gordon Cain	Boston, Mass.	15:53.0
Open:	James Cahill	Connorsville, Ind.	17:21.9

Fuselage, R.O.W., Class B

Junior:	William Ehrlich	Chicago, Ill.	0:32.8
Senior:	David Call	Kenmore, N.Y.	13:12.0
Open:	None Established		

Autogiro

Junior:	Edward A. Vargo	Chicago, Illinois	3:53.7
Senior:	Ralph Brown	Boston, Mass.	2:51.2
Open:	Joseph Matulis	Chicago, Ill.	2:45.5

Ornithopter

Junior:	Edward A. Vargo	Chicago, Ill.	1:18.0
Senior:	John Beck	Chicago, Ill.	3:22.0
Open:	Carl Goldberg	Chicago, Ill.	4:05.4

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Junior:	Richard Querman	Clarksburg, W. Va.	3:54.6
Senior:	James Broderick	Chicago, Ill.	5:34.4
Open:	Carl Goldberg	Chicago, Ill.	5:25.0

Flash News

(Continued from page 12)

three months."

DOUGLAS AIRCRAFT has produced a second luxury C-54 *Skymaster* transport for personal use of General of the Army Eisenhower. The giant is similar to President Truman's "Flying White House" which was used by the late President Roosevelt on his many overseas trips. General of the Army MacArthur uses a similar plane as a flying headquarters to direct operations in the fast-moving Pacific war.

THE ENTIRE 58th Bombardment Wing of the 20th Air Force, comprising 150 Boeing B-29 *Superfortress* long range bombers recently flew from India to Tinian, a distance of 3,600 miles, without losing a single plane.

THE MYSTERIOUS death of Col. Gen. Ernst Udet, famed German pilot who thrilled National Air Races fans in this country, has been revealed as a forced suicide by a captured aide of Goering. The official Nazi announcement of Udet's death in 1941 said he died while testing a "new German secret weapon." The secret weapon, according to the aide, was a revolver held against Udet's head!

AERONCA AIRCRAFT has announced that two new models will be in production for civilian consumption before Labor Day. The Aeroncas are both two plane 65 hp designs with 90 mph cruising speed. One is tandem and one is side-by-side seating. Aeronca has received 65,000 inquiries from interested purchasers!

(Turn to page 54)

IT'S Air Flo Again!

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60c

POSTAGE: On orders up to 79c add 3c, to \$1.00 add 10c, to \$1.50 and over, add 15c.

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THE GREATEST DEVELOPMENT IN
SOLID Balsa GLIDERS—

25¢

EACH. SEE YOUR
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DER DIRECT ONLY
IF HE IS OUT. NO
ORDERS FOR LESS
THAN FOUR MOD-
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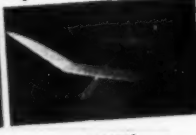
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THE *only* MODEL GLIDERS
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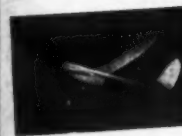
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FOR THEY ARE *DESIGNED TO*
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P-S GLIDERS ARE BUILT STRONGER,
TOO, WITHOUT EXTRA WEIGHT.
SCIENTIFIC DESIGNING DOES IT.
BUILD ONE AND SEE.

ONLY QUALITY Balsa USED IN
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YOU WILL BE PLEASED WITH HAV-
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Models & Supplies Price Lists: for 3c stamp

THE HOBBY BUREAU

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A NEW FIREBOMB is in production at Chrysler's Evansville, Ind., plant. It weighs 10 lbs., is made of magnesium and is filled with petroleum jelly. Each bomb starts an average of 40 fires and 38 of the bombs are mounted in a 500 lb. cluster. A Superfort will carry 37 of these clusters, indicating that a single bomb load will start 56,000 separate fires in Tokyo and other Japanese cities, more "aid and comfort" we hope!

SMITHSONIAN INSTITUTION received the first Bell P-59 Airacomet, our first successful jet propelled airplane. It is now on permanent exhibit suspended from the ceiling. The plane made its first flight on October 1, 1942 but was held in great secrecy until release of news by the AAF in January 1944.

ADD BRITISH Fighter planes: the Westland Welkin is a development of the unique Whirlwind although with greatly improved performance. It has a span of 70 ft. largest of any pursuit plane in existence. It is powered by two Rolls-Royce Merlin engines of 1,650 hp each and has a top speed of 385 mph.

A NEW STRATOSUIT has been developed which consists of a rubberized suit which may be pumped up to 4 lbs. pressure, thereby providing the pilot with livable conditions at high altitude.

At 80,000 ft. the pilot would have pressure conditions existing at 28,000 ft. The new suit has breathing oxygen, ear phones and an electrical heating system. The rubberized fabric permits complete freedom of motion and the wearer may even write a letter. The headpiece is a transparent plastic "bubble" design and all connections are routed through a single plug.

PAN AMERICAN announces plans to use four types of giant Clippers for post-war service. Clipper type 8 will be the Lockheed Constellation carrying 56 passengers at 300 mph with range of more than 1500 miles to be used for express schedules on medium range routes. Clipper type 9 will be the Douglas DC-7 carrying 108 passengers at 300 mph with a range in excess of 2500 miles. Clipper type 10 will be the Lockheed L-89, a huge double decker capable of carrying 128 passengers and crew of 11 in excess of 2300 miles. Clipper type 11 will be the Consolidated-Vultee CV-37 which will carry 204 passengers at 340 mph over 3100 miles.

A CONTRACT FOR three variations of the Boeing C-97 was announced but the number of planes involved has not been released by the War Department. The first type scheduled for delivery will be

almost identical to the three C-97's already in experimental service and will be combination troop and cargo carriers. The second type will also be troop and cargo carriers but will have more powerful engines and some design modifications. The third type, consisting of a single airplane will be similar to the second type except it will be fitted with transport type seats for Army transportation use; will be designated YC-97.

DOUGLAS REVEALS that a standard C-47 has been converted into the largest glider in the AAF. Designated XCG-17 by the Army it has been undergoing tests for some time. Releasable results of these tests reveal that the XCG-17 can be towed at speeds up to 290 mph, that it has a remarkable low stalling speed of 35 mph as compared to CG-4A's 55 mph.

A NEW Corsair Navy fighter, the F4U-4, has joined the U. S. Fleet. The major change in the new model over previous Corsairs is incorporation of the P. & W. Double Wasp R-2800-C engine. Other slightly apparent visual changes are the 4 bladed Hamilton Standard Hydromatic propeller, an elliptical shaped cowl with an air intake in the bottom arc and larger and fewer engine cowl flaps. The new model will also be built by Goodyear Aircraft.

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Better APPEARANCE For Your Scale Model

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	1 1/2. 05	DOPE ALL COL.
	1 1/2. 07	ORS 6c; 10c; 50c
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	1 1/2. 80	1/2. 10c
	1 1/2. 85	1/2. 10c
	1 1/2. 90	1/2. 10c
	1 1/2. 95	1/2. 10c
	1 1/2. 1.00	1/2. 10c
	1 1/2. 1.05	1/2. 10c
	1 1/2. 1.10	1/2. 10c
	1 1/2. 1.15	1/2. 10c
	1 1/2. 1.20	1/2. 10c
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	1 1/2. 1.30	1/2. 10c
	1 1/2. 1.35	1/2. 10c
	1 1/2. 1.40	1/2. 10c
	1 1/2. 1.45	1/2. 10c
	1 1/2. 1.50	1/2. 10c
	1 1/2. 1.55	1/2. 10c
	1 1/2. 1.60	1/2. 10c
	1 1/2. 1.65	1/2. 10c
	1 1/2. 1.70	1/2. 10c
	1 1/2. 1.75	1/2. 10c
	1 1/2. 1.80	1/2. 10c
	1 1/2. 1.85	1/2. 10c
	1 1/2. 1.90	1/2. 10c
	1 1/2. 1.95	1/2. 10c
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	1 1/2. 2.45	1/2. 10c
	1 1/2. 2.50	1/2. 10c
	1 1/2. 2.55	1/2. 10c
	1 1/2. 2.60	1/2. 10c
	1 1/2. 2.65	1/2. 10c
	1 1/2. 2.70	1/2. 10c
	1 1/2. 2.75	1/2. 10c
	1 1/2. 2.80	1/2. 10c
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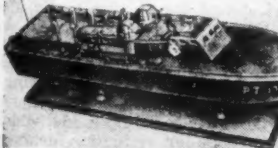
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19" span. Completely sanded and cased, twin booms, and engine cabin. Much semi-finished contents. Spectacular plans.

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First Model to Fly by JET PROPULSION

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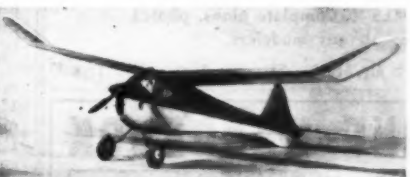
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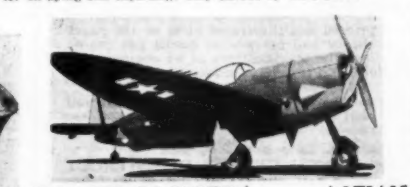
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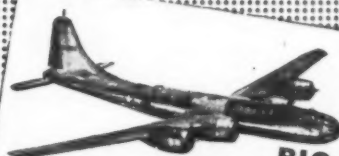
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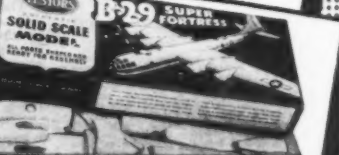


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Hispano-Suiza Engines

(Continued from page 17)

and improvements were installed, but the simple clean lines of the exterior, with the exception of the oil pan, were never changed. The engines were built on the 90° Vee style with two banks of four cylinders each. They had been built in the direct-drive and geared-down drive models. The 150, 180, 200 and 220 hp models all had the same bore and stroke (4.72" x 5.12"). Variations in horsepower were obtained by fitting larger carburetors, larger induction pipes and increasing the rpm and compression ratios.

The cylinder ports were cast in an aluminum water jacket bored for the passage of cooling water. Four flanged steel barrels with one end closed were screwed into the cast aluminum water jackets to form the cylinder walls. The lower half of the steel barrels project outside to form the cylinder block or bank's mounting surfaces. These mounting surfaces were bolted onto the cast aluminum crankcase. The entire cylinder block was coated with baked black enamel which gave it a high gloss.

The aluminum crankcase was cast in two halves split on the horizontal plane through the crankshaft. The upper half was of very light shallow casting with machined surfaces at the place where the cylinder banks were mounted. Lower half of the crankcase was of heavier aluminum casting because it had to carry the bearings of the crankshaft. The two halves were bolted together to form an oiltight crankcase unit.

The ignition was provided by two high tension magnetos located at the anti-propeller end. The two spark plugs per cylinder were designed to fire simultaneously. Starting the engine was accomplished by swinging the propeller; when a self-starter was provided aircraft batteries were installed.

The engine was cooled by water circulated by a centrifugal water pump. The water entered the jacket at the bottom near the rear end of the engine and was ejected from the jacket at the top near the front end of the engine.

Various engine models were given letters of the alphabet by the original Hispano-Suiza firm. Each letter meant a model that was different in horsepower, gearing, carburetor and intake pipes. A brief description of each follows:

MODEL A—The original design submitted to the French Air Ministry. Rated 150 hp at 1450 rpm it was used without oil coolers and was a direct-drive type. It was first installed in the Spad and the early S.E. 5's. Some Model A's had a starting crank at the anti-propeller end.

MODEL B—Served as the power plant for trainers as it was a four cylinder affair. It used the same cylinder bank as Model A but was mounted on a vertical axis. It rated at 75 hp.

MODEL C—The 200 hp Hispano-Suiza model, called the C, was really Model A operating at a higher speed with a geared-down propeller drive shaft. The propeller shaft extended the entire length of the engine in the Vee. Driving gears were located at the anti-propeller end.

MODEL D—A 200 hp model which employed propeller reduction gears at the propeller end. Provisions were made for installation of a machine gun in the Vee, made possible by shifting the carburetor as the propeller drive shaft was hollow.

MODEL E—This Hispano-Suiza engine was rated 220 hp on a direct-drive. It was the same as Model A but employed a larger carburetor.

MODEL F—Similar to the D except no provisions were made for installation of a gun in the Vee.

MODEL H—This 300 hp model was quite similar to the E, the only changes being on the exterior where square mounting bosses were used for the exhaust stacks.

MODEL K—This type was designed to carry a 37 mm cannon in the Vee and rated 300 hp. The crankcase was joined on a vertical instead of a horizontal axis as on previous models.

Basic Design Problems of Model Helicopters

(Continued from page 15)

stresses onto the smaller rotors. This type is definitely not recommended for model experimentation.

The fifth type is the newest and has received quite a bit of attention. In this type there is but one main rotor which is activated by jets located in the tips. Thus thrust is contained within the rotor and, acting directly upon it, automatically eliminates torque effect.

It is interesting to note in relation to full sized ships that this idea appears basically sound for two very good reasons. Tip speeds approach velocities at which jet propulsion works best and with the power being applied to the tip of the rotor instead of the hub the mechanical advantage is much greater, permitting concentration of thrust where drag is heaviest and allowing rotor structures to be lighter.

As far as model helicopters are concerned, however, this method offers many difficulties. The writer has succeeded in making a compressed air jet powered rotor lift its own weight (and no more) under 90 lbs. pressure, and a steam jet rotor lift its own boiler—but not its heat source. Powder rockets will supply enough thrust and are not overly heavy, but their extremely short duration is discouraging.

Therefore the remainder of this article will deal with the first three types. Power utilized for these experiments is rubber, chiefly because of the simplicity of hook-up and the high power-to-weight ratio. Helicopter gas models will probably be built, but for the present it is undoubtedly best to leave out the added complexities of internal combustion until familiarity with the stability problem is gained. A gas engine would produce a fine steady source of power, but would also mean slip-clutches and gearing. Unless one has access to a machine shop these items are rather difficult to produce.

The design of the model helicopter poses the question: "Straight up, or straight ahead?" If the model is designed to fly vertically and attain the greatest possible elevation it seldom can be adjusted for "cross country" flights of any great duration. One exception to this rule is the contrarotating type with a free-wheeler which may be adjusted to move forward as it climbs by adding weight to the nose. It will continue to move forward during its free-wheeling descent but "glide" ratio will be small. Since model helicopters are designed primarily to fly vertically, the experimenter would do well to concentrate upon arriving at a design capable of a steady climb and slow descent with good stability throughout the flight. Then, and only then, should he attempt "cross country" flights.

The following sketches are presented primarily to stimulate the imagination of model experimenters; however, if the

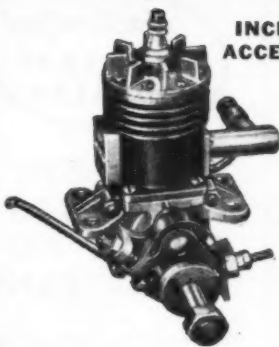
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general proportions are followed throughout these models will fly well, though in no case is any sketch intended to represent a completely "perfect" solution.

Fig. 1 is perhaps the simplest possible form. It is a direct takeoff on the familiar contest whirligig and is the easiest to build and fly. Directional stability is only fair, but "glide" is quite good if a free-wheeler is employed. The long nose-wheel strut protects the lower prop and brings the center of gravity forward. Rubber hook-up is simple and contrarotation is automatic.

In this, as in all types of model helicopters, too much emphasis cannot be laid upon the importance of making the rotor blades flexible. For every foot of radius the blade should have a "spring" of at least 1-1/2". This enables them to

bounce and helps to destroy the aforementioned gyro effect.

This model is described first to point out the effect of keel surface upon the flying qualities of the helicopter. Note the very narrow rear section and pointed nose. This is because when displaced air produced by the upper rotor strikes the fuselage it has a marked tendency to rotate it in the direction of the rotors movement. Therefore, the larger the keel-surface the greater the turning moment. A friction brake on the lower prop is, in theory, the best way to counteract this effect. In practice, however, it proves tricky to adjust. A felt washer on the lower prop will often turn the trick, but a fin hinged on a fore and aft axis works better. This same effect is why pylon gas jobs turn to the right under full power, when one might be in-

clined to think they should swing to the left because of the torque.

One tricky phase of keel-surface, or lateral area, should be mentioned before going any further. In fixed-wing models one usually attempts to get the center of lateral area as low as possible. The reverse of this ordinarily good rule is true in model helicopters for this reason:

At the top of the flight the rotors come to a stop, then reverse for a free-wheeling descent. The rudder effect of the fuselage side-area is very pronounced at this moment, and if the area below the center of gravity exceeds that above it the model will flip over on its back and descend inverted.

Therefore, in designing a model helicopter one must work out a good compromise with sufficient area above the center of gravity to permit a right-side-up descent and sufficient area below the c.g. to permit a stable climb. About 60% above and 40% below is about right, although on some types it is advisable to have as much as 75% of the lateral area above the c.g.

Fig. 2 is the contrarotating type. Two rotors of equal diameter revolve in opposed directions. Hook-up is simple but care must be exercised in building the "cage" and all bearings must be true. Balance of all moving parts is the keynote to success with this model. Directional stability is very good and this sketch points up another phase of helicopter design. In this model, forward flight may be secured by adding weight to the nose, and the mass of lateral area must be well back of the rotor axis to keep it headed right. However, this brings in another factor: top-of-fuselage area. Since with this type there is more area on top of the fuselage exposed to the downwash of the rotors, behind the rotor axis, if the model balances directly on the rotor axis the downwash will force the tail down and give the model all the symptoms of tail-heaviness. This is best counteracted by balancing the model slightly ahead of the center of lift.

The upper rotor should be equipped with a free-wheeling device for easy descents, and it has been found that best results are obtained if the lower rotor has a slightly greater pitch—about 2°. The climbing ability of this type apparently exceeds that of all others. This is probably due to the direct utilization of available thrust where it will do the most good with a minimum of fuselage or deflection interference.

Fig. 3 illustrates the dual rotor helicopter. Principal problem here is to equalize the thrust of the two rotors. The simplest and most positive way to accomplish this is by an equalizer beam. Hook-up should be clear from the sketch.

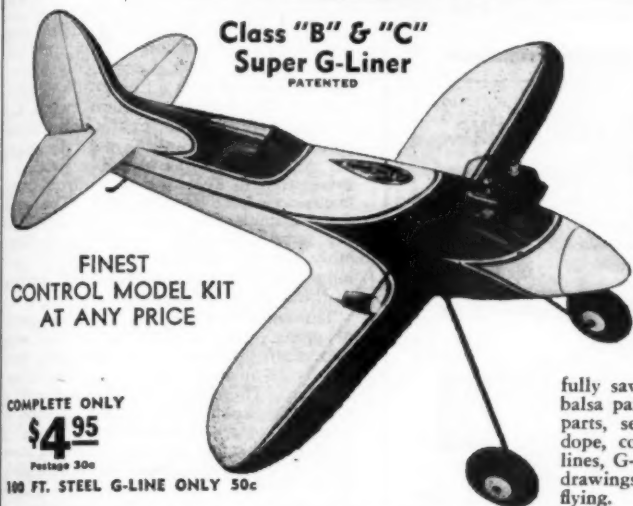
In this model it is highly important to keep the center of lateral area as high as possible and to make the two rotors as nearly identical as possible. This helicopter is the simplest to adjust for forward flight as it climbs. Simply add a bit of weight to the nose.

Fig. 4 of the Platt-LePage pattern is basically the same idea as Fig. 3. Power transmission of some sort is needed for this type, therefore it requires a lot of work in building and excellent balance for good results. Pulley and belt, of the kind described in Fig. 5, seems to work better than the connecting-rod type of transmission. Bevel gearing might be the ideal solution if a set of the same light enough for practicality, could be obtained. A horizontal stabilizer seems to be necessary on this model and a...

(Turn to page 60)

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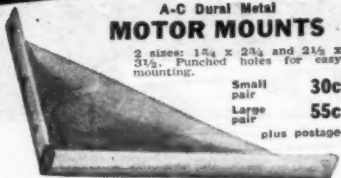
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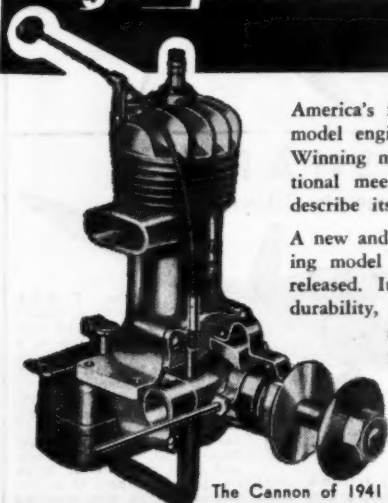
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der often helps. The best way of finding is by a small crank in the nose section as shown on sketch.

Fig. 5 is based on the Sikorsky design. This is the model shown in the accompanying photograph. Power transmission to the rear prop was a great problem in designing the original. After numerous experiments the pulley and belt system was adopted as the most simple and efficient. Ordinarily one might think such an arrangement would result in slippages so great as to obviate the possibility of any constant ratio between the main rotor and torque propeller. This problem, however, was solved very nicely by facing the pulleys with a fine grade of sandpaper. The belt is common twine, tied snugly in place and shrunk with water.

A four bladed rotor is used to absorb as much thrust as possible within a small area to keep the anti-torque rotor boom as short as possible. The main disadvantage of this type is the short rubber length, but due to the proportionately slow revolutions of the main rotor longer flights than one might be inclined to think possible may be had.

This model works best under power, dropping quite rapidly after achieving maximum altitude. It is presented here chiefly as an experiment in power transmission. The model will fly well only if weight is kept down. This method of nullifying torque rather than "using" it does not seem to be very efficient, more rubber being required proportionately to fly this type of model than one featuring dual, or contrarotating props.

One interesting fact about the anti-torque propeller was discovered: It does not need to produce a thrust anywhere near equal to the torque reaction produced by the main rotor in order to hold the ship steady. This is probably due to a keel-surface effect produced by the spilling of air from the tips of the main rotor against the apparent disk of the anti-torque propeller, which would of course tend to push the boom in the direction of the main rotor.

Adjusting this model so that torque is evenly balanced is quite simple. With a pulley ratio of 3-1 start with the blade area of the little prop equal to 1/4 the area of the main rotor. This will cause a slight over-correction and cause the boom to swing around in the direction of the big prop. Then trim the small rotor, a little at a time until it balances. This is considered the best way, even if it amounts to cut and try, because it has been found that a difference in bearings and pulley alignment is peculiar to each builder, with a natural slight difference in results. If the blades are over-trimmed, add a small fin to the boom in the slipstream of the larger prop and trim it to fit.

Once adjusted this type will stay adjusted. Varying power used will not upset the ratio between the two rotors.

It is a good idea for the serious experimenter to keep a record of his experiments for future reference. Patience is the keynote to success. Do not give up any design type until you are certain you have tried everything that can be done with it. Often a very simple "bug" will prevent a model helicopter from performing well. Once this is located the model will often turn in a surprising performance. Remember that in these little jobs a somewhat different set of conditions holds sway from those of conventional models. Respect those conditions and success will be yours.

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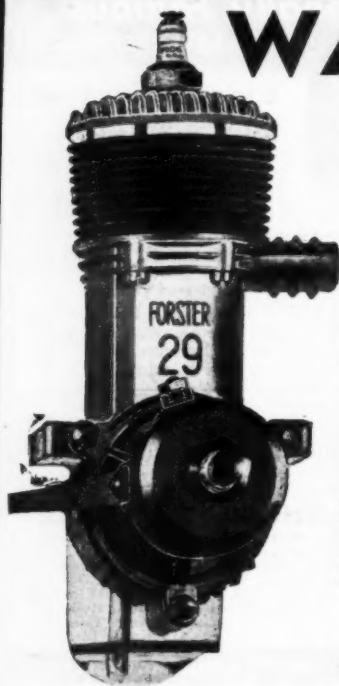
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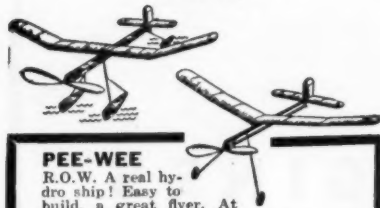
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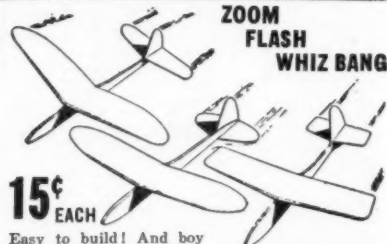
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Off the Line

(Continued from page 2)

mercial affair and unfit to mingle with other organizations. We see no difference between a model club sponsored by a newspaper, a department store or a hobby shop. The first two organizations are usually out for the publicity; the hobby shop rarely gets much.

Furthermore, any model shop proprietor that sponsors a club is anything but a Scrooge (sure, sure, there always are a couple of exceptions). The credit side of his ledger doesn't rise much—if at all. He's always being nicked for trophies, motors and kits for prizes; he spends much of his free time working at club meetings or contest activity; and he's always slipping somebody a motor "on the cuff."

These boys are to be praised, not censured. In many a community there'd be no aeromodeling club except for their hard work and interest. So in recognition of what these shops have been doing for the past couple of years, we propose more publicity be given their work and suitable prizes awarded the most civic minded and progressive stores. We suggest "Oscars" be conferred by the model industry association each year.

ASTONISHING as it may seem, we find a few words of praise tossed occasionally to the Academy of Model Aeronautics. That's definitely a new trend. It used to be strictly *pas bon* (not good) to acknowledge the Academy right in anything.

Latest proposals call for A.M.A. Contest Board (rules formulating) members to be elected by licensed flyers. Good idea for the postwar Academy. More emphasis on Academy scientific membership has been suggested. Sounds fine.

Everyone seems very serious minded these days. If the expert isn't reading a book, he's writing one. Dozens of new books and pamphlets are available on every phase of aeromodeling. Research and investigation are the order of the day. Like babies, all new models are now nurtured according to formulas.

Controversy still rages over equitable contest rules. It's obvious that no rules will be perfected which will please everybody all of the time. But serious thought is being given to the development of some simple method (there's the stickler) enabling large and small engines to fly in the same event with fairness to all. There is a lot of plugging for these "scrambled contests." How to do it and stay away from calculus and keep everybody happy—that's the problem.

There's no lack of contests, even a few big ones now and then. A lively interest has been demonstrated in gliders, particularly in tow line models, and gas hydro events. Dethermalizers are being used on the larger gliders. Hydro designs are getting cleaner and the models are staying dryer.

Control line flying has made rapid strides. Some opposition is encountered. But impartial observers (most of us G.L.'s, let us say), can see control events as just the place and practically the only place for scale models, dream ships, and multi-engine jobs until radio control comes back or carrier-current is developed. And if you're the poetic type who likes to hear the wind whistle through the trees, then straight speed is your dish. So far no entries have approached the speed of sound. A.M.A. rules now govern sanctioned control events.

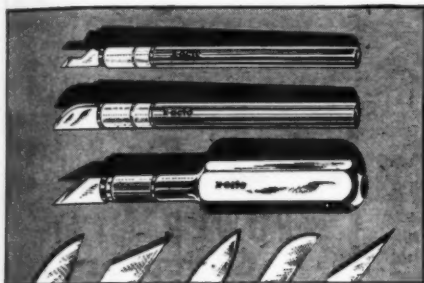
Despite going into uniform or war work quite a few of the "old gang" have been

(Turn to page 64)

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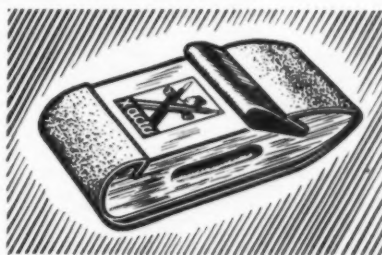
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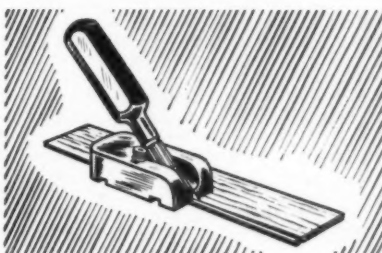
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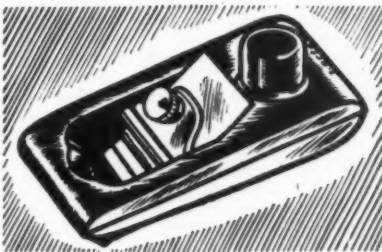
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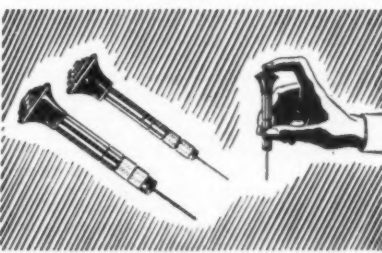
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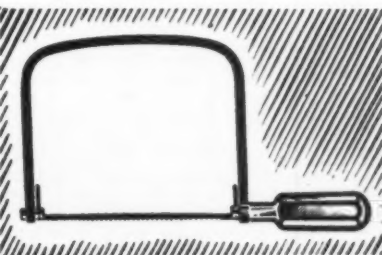
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around through magazine articles or at meets. But for a lot of the lads the last stop watch has been held—fellows like Tom Fleming, for instance, a long-time New England indoor expert who went down in a Clipper crash in the Caribbean; and Ralph Brown, many-time National record holder, who lost his life during the German break-through preceding the Allied push for the Ruhr.

It's been a rough, tough fight. But one good feature for those who return will be the contests and the clubs and the interest that are still there—carried on in the typical exuberant American fashion that means "Home."

Airways

(Continued from page 29)

covered with pre-war silk. Incidentally, I had more trouble finding enough balsa than I did finding 10 yards of silk. The total time spent building the model was over 2-1/2 years. I've been building models since 1927. The first gassie I built was back in 1933 and I have since found gas powered stuff a wonderful pastime."

No. 9 belongs to Jim Dobyns, 728 Wisner St., Park Ridge, Ill., who writes: "The wingspan on my Eaglet glider is 4'. The model was constructed from a kit and the entire ship is of balsa and hardwood. Wings, body and tail are completely planked with 1/32" sheet balsa. The cabin is detailed, containing a cushion seat, instrument panel and movable joy stick. The windshield is clear acetate sheet. I was trying to get a very smooth glossy finish and used five coats of dope, lightly sanded between coats. Two colors were used—bright red and yellow. Masking tape is responsible for the straight lines between the two colors, although I would have liked the results to be even more successful. I spent about 50 hours on this model off and on over a period of several months. The picture was taken by my Dad who makes a hobby of amateur photography. It was made under artificial light in the dining room with the model hung on threads; a sheet at the far end of the room served as background, and a broad spotlight thrown on the sheet made the model appear as though it were in flight. The camera used was a 4 x 5 view and the film was a medium speed panchromatic." Between Jim and his Dad, they have a model to be proud of.

Joseph L. Neil, Box 1845, Pampa, Tex., sent in No. 10 depicting his Pudgy gas model. It seems this is Joe's first attempt to crash the "Air Ways" section—and perhaps he had beginner's luck. But let's hear what he has to say: "The wingspan is 5', length 44". Power is supplied by a Bunch Aero. Wing section is a Grant X with a chord of 10", and the weight totals 3 lbs. 4 ozs. Climb is rather sharp (approximately 35") for a realistic type model. Glide ratio is close to 18 to 1, and the longest flight obtained was 27 min. 48 sec. on a 20 sec. motor run. Covering was made with bamboo paper, applying 6 coats of clear dope first then 3 coats of colored and then another of clear dope (10 in all). Color scheme incorporates green trimmed in cream. I have been building models since 1930, specializing in my own original designs. However, I did deviate from originals on two occasions and both times I chose plans from M.A.N. At present I am foreman of the Engineering and Drafting Dept. of the Army Air Forces Advance Twin Engine School (B-25's) and I really owe my position to model building. No kidding—it's been the best investment I ever

(Turn to page 66)

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made and whenever I get any spare time I try to 'whip' up another model. I'm interested in hearing from fellow modelers and would appreciate receiving mail from those so inclined." After seeing your model, Joe, and reading what you have to say it's a "cinch" you're going to be deluged with mail.

The Curtiss P-40 scale model shown in No. 11 is the submission of an unusual modeler, George N. Bruun, 2025 H St., Eureka, Calif. George admits to 46 years, and while mature in years he certainly possesses a youthful spirit capable of both enthusiastic and skilled workmanship. Incidentally, photography is also another of George's hobbies and he can also take credit for the professional picture displayed. You're truly an Artist!

No. 12 shows Bill Olson's Laird Turner Pesco Special model. Bill, who lives at 1906 So. 4th St., Rockford, Ill., says the ship won him a \$25 war bond during a contest in 1943.

CLUB NEWS

Arkansas

Little Rock Exchange Club has renewed its practice of holding an annual model airplane contest and plan to hold one early in August. Many entries are expected as this contest is not only statewide but will be participated in by boys from adjoining states. The meet is open to both rubber and gasoline powered craft and scale models of military types. Further information may be obtained from E. F. Brueggeman, Pres., Gazette Bldg.

California

New rules headlined the colorful 18th semi-annual Gas Model Contest sponsored by Los Angeles Modelers at the Western and Rosencrans Field on July 1 before 5000 spectators. Ray Acord of Bunch Motors was contest director.

Following revision of engine classification was the greatest change: Class A from 0.00 to 0.25; B from 0.26 to 0.50; C from 0.51 to 0.65. Planes above 0.65 were not allowed to compete, being classified for radio control competition only. Otherwise, existing AMA rules were adhered to, with addition of two timers being placed on each engine run, and one timer on a full flight. Maximum of 10 min. was allowed, with no penalty for flight over 10 min.

Ted Gillett of Hollywood again won the Morgan Sweepstakes with top award in Class C for flight and appearance with

his Cyclone powered Sailplane, and close third in Class B with Zipper, Torpedo powered. One of the new rulings is that a model plane must finish in one of the first seven places in performance to be eligible for the appearance award. Ted's Sailplane proved beauty and operation perfection can be attained.

Clyde Bracy, Los Angeles, won in Class B with an Arrow, Torpedo powered, which also won for him the Ray Acord Longest Flight Trophy.

Ensign J. E. Drake, U. S. Naval Air Corps, of San Diego, won in Class A with an original design, Ohlsson 23 powered. Royce Childress, Los Angeles, won first prize in the Junior Division with his Cyclone powered Sailplane. Pretty Barbara Bates, promising movie starlet, officiated in the award presentations. The Los Angeles Junior Chamber of Commerce Aviation Committee announced plans are under way to have the Nationals in Los Angeles in 1946 if the war ends. In any event, a big West States Meet will be scheduled for June or July 1946. The next Free-Flight Meet will be held November 1, 1945.



Ens. Drake accepts trophy from Barbara Bates

Fresno Gas Model Airplane Club's last monthly contest was not as successful as could be desired. The fault lay not with the contestants but with the "buffalo gnats" which arrived uninvited and took possession of the field. When the gnats bite they raise welts that itch and ache for about ten days so we can't blame many of the boys who left for home. However, some hardy souls remained and the results were:

Class A—(1) Bill Dunham; (2) J. Marshall; (3) Bud Warner.

Class B—(1) Bill Dunham; (2) Van Tassell; (3) Bud Warner.

Class C—Ted Dice.

The F.G.M.A.C.'s monthly glider contest proved more satisfactory. A slightly windy day with good thermals greeted the glider boys. Henry Vincent lost his towline on its first official flight with a time of 9.00 min. even. He also lost his hand launched glider on his 3rd flight. Bill Dunham had the unusual experience of seeing his glider land on top of the big 3 ring tent of the circus playing in a nearby field but an attendant got it down for him unharmed. Final results:

Hand Launched—(1) H. Vincent; (2) A. Tootellian; (3) R. Balekian.

Tow-Line—(1) H. Vincent; (2) R. Balekian; (3) W. Dunham.

Catapult—(1) R. Balekian; (2) A. Tootellian; (3) H. Vincent.

The following officers were elected at the last meeting of the Fresno U-Controllers: Geo. Carroll, Pres.; Capt. Walter Groom, Vice Pres.; Earl Adams, Sec'y; Treas.: Bruce Gaines, Contest Mgr.; and Bob Bennett, Head Timer. Meetings are

(Turn to page 68)

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held every other Monday and flying takes place every Tuesday evening at the Fresno High School.

Illinois

After a postponement due to rain, the 4th annual Sky Wolves championship U-Control meet was finally held at Recreation Park in Arlington Heights. Weather conditions on the rain date were not much better but enthusiastic modelers decided to brave the elements and 48 of the 66 entries were on the field.

Jim Wilson, novice model pilot from La Porte, Ind., won the championship trophy by scoring the highest number of points for the day, using a single plane. Jim flew a Tiger powered monocoque. Dale Williams, Treas. of Sky Wolves, was the club high point pilot winning the Hagenbring Hi-Point Trophy. In all events, with the exception of aerial combat, competition was held in two groups—advanced and novice flyers. The advanced flyers were contestants previously winning prizes in U-Control competition. The novice pilots were beginners and older pilots who have been dogged by a black cat. Results were:

SPEED TRIALS

Class A Senior—(1) Bill Warner, 41.75 mph. (Only official flight in this group.)

Class A Novice—(1) John Somers, 55.25 mph; (2) Dave Webb, 35.75 mph.

Class B Senior—(1) Clyde Branch, 59.00 mph; (2) H. Peters, 55.25 mph; (3) Bill Warner, 50.25 mph.

Class B Novice—(1) M. Carlson, 60.00 mph; (2) Paul Vabakos, 51.00 mph; (3) Ronald Wiegand, 45.50 mph.

Class C Senior—(1) H. Peters, 75.00 mph; (2) Clyde Branch, 74.00 mph; (3) H. Peters, 66.00 mph.

Class C Novice—(1) Jim Wilson, 44.25 mph; (2) Dale Williams, 37.25 mph.

PRECISION LANDING EVENT

Senior—(1)Clyde Branch; (2) Ken Flaglor; (3) H. Peters.

Novice—(1) Jim Wilson; (2) Dave Webb; (3) M. Carlson.

AEROBATICS

Senior—(1) Bill Warner; (2) Bob Ragland; (3) Bill Warner.

Novice—(No official flights).

The Aerial Combat event was somewhat of a let-down, only five contestants braved the wind. Of these, Paul Vabakos was the only pilot scoring. Although he did not score an actual hit, Paul was given credit for a probable when he forced Bill Warner's plane out of the sky. Incidentally, Bill's relay-controlled Ohlsson powered Waco cabin biplane was considered the best.

Kansas

The results of the Wichita model airplane championship meet sponsored by the Hy-Flyers Club have been received:

Class A Gas—(1) Joe Yeager.

Class B Gas—(1) Geo. Cosand; (2) Paul Koch;

(3) Joe Yeager.

Class C Gas—(C) Clay Lacy; (2) Darrel Miner;

(3) Ernie Stevens.

Sr. Rubber—(1) Les DeWitt; (2) Ken Dunlap.

Jr. Rubber—(1) Victor Sullivan.

Sr. Tow line—(1) Carl Unruh; (2) Dick Holloway; (3) Stan Sweeney.

Jr. Tow line—(1) Dean Dunlap.

Sr. Hand Launch—(1) Bob Bash; (2) Dick Holloway; (3) Carl Unruh.

Jr. Hand Launch—(1) Bob Jeffers; (2) Dean Dunlap; (3) Jimmy Clay.

The Hy-Flyers are holding an A.M.A. sanctioned state meet on Sept. 3rd in which they hope to top prizes offered by all other meets in the U. S.

Two new clubs have been reported. One is the Downtown "Y" Boys' Club which meets on Mondays at 10 a.m. under the leadership of Roy Dunlap. They report real progress with more than 20 new members and have scheduled some hand launched glider exhibitions at Veterans' Hospital Field.

The other is the Beacon Carriers' Club, which is now meeting weekly in their (Turn to page 70)



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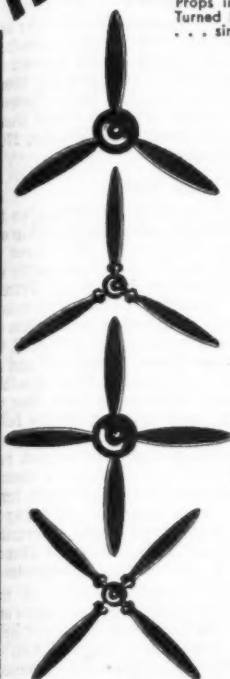
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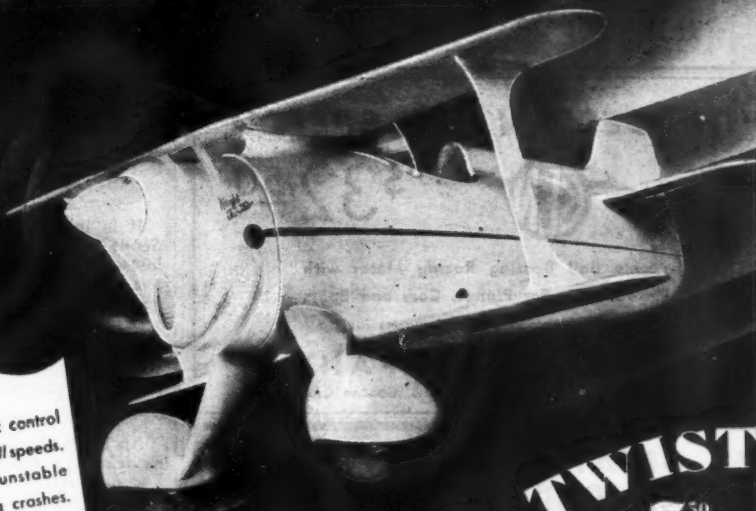
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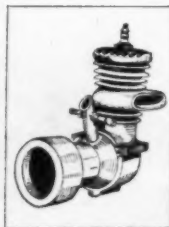
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Nebraska

As a good many former *Sky Hawks* are being ushered into the services another club is being organized—to be known as the *Prop Choppers*. Watch out for these boys. Other clubs are also being formed and any information desired about them may be obtained from Jack Fluehr, 1706 Howard St., Omaha.

New York

The Long Island *Sky Lancers* plan to hold their fourth annual championship on August 26th at Hicksville. The meet is A.M.A. sanctioned, will start promptly at 9:00 a.m. and close at 5:30 p.m. Prizes, consisting of trophies, kits and merchandise will be awarded in each class at 6:30 p.m. Events include Classes A, B, C, gas powered, free flight, Classes C and D towline glider combined. The possible lack of a public address system, due to war limitations, will necessitate the fullest cooperation of contestants and spectators in observing flight areas and requests of field contest officials to assure a well-run contest and a pleasant time for all. This gives promise of being a really bang-up meet; all those interested should contact Ed Yulke, Contest Director, at Mildred and Stanton, Hempstead.

Attention—all model builders in the vicinity! The *Schenectady Aeroneers* are going to hold the largest contest yet held in the eastern part of the state. When?—Sept. 23rd. Where?—Spacious Schenectady County Airport. Time?—10 a.m. to 5 p.m. The events include rubber, towline, free flight gas and control line gas. An air show by the Civil Air Patrol will follow the contest and it will be well worth seeing. Further information may be obtained by writing Raymond Voigt, 202 Jackson Ave.

The *Williamsburg Model Craftsmen* of Brooklyn will hold an A.M.A. sanctioned free flight gas model contest at Hicksville on Sept. 2nd. Trophies, medals and a war bond will be awarded in addition to model kits and supplies. The contest will begin at 9 a.m. and end at 5:30 p.m. Entry fee is 50c before 1 o'clock and \$1.00 afterward. For information about the contest write S. S. November, 593 Lenox Rd.

Texas

It is interesting to note that the *Air Scout Sqd. No. 1* of Beaumont held their last contest on the point system:

Speed (A, B and C)—1st—15; 2nd—10; 3rd—5.
Stunts (any class)—1st—15; 2nd—10; 3rd—5.
Spot Landings (any class)—1st—15; 2nd—10; 3rd—5.

Incidentally, the club would like to increase its membership, so will all those interested please apply.

Washington

An inter-city contest for free flight gas models was recently held between the *Tacoma Aeromudlers* and the model builders of Olympia. It was an open event, Olympia taking first and fourth, and the *Aeromudlers* second, third and fifth. There was also a trophy awarded for the cross country event which is one where the man with the highest time in the air for a given 15 min. wins. The catch comes when you have to be back at the starting point with your plane before the 15 min. are up. The *Aeromudlers* took first, second and third in this event. Further information about these boys may be obtained from the club secy, John Dimmer, Box 154, Lakeview.

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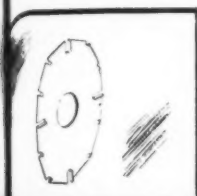
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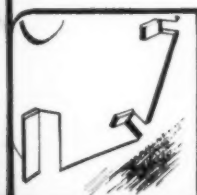
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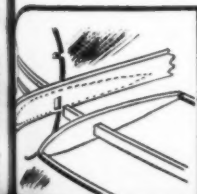
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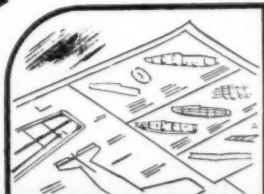
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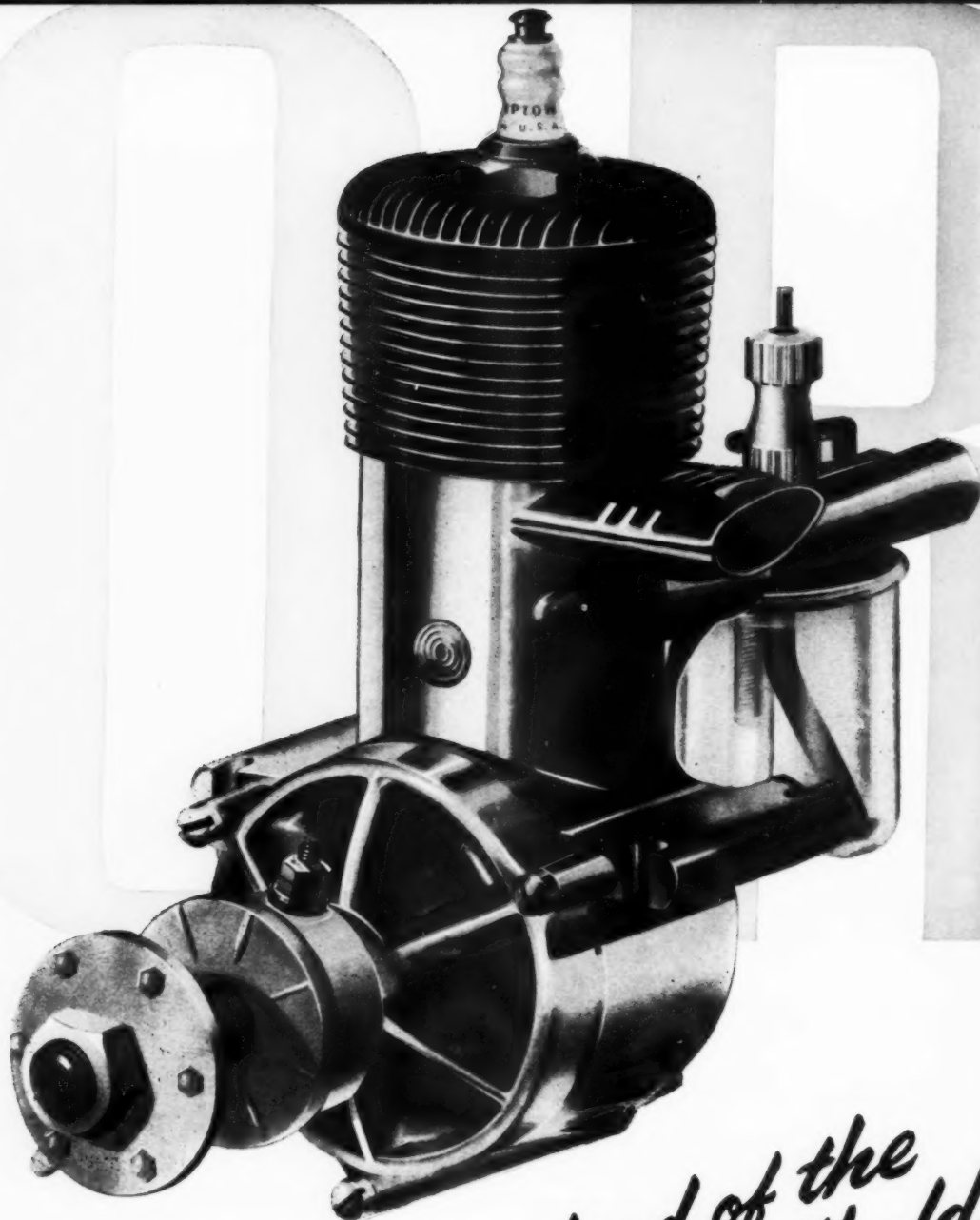
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